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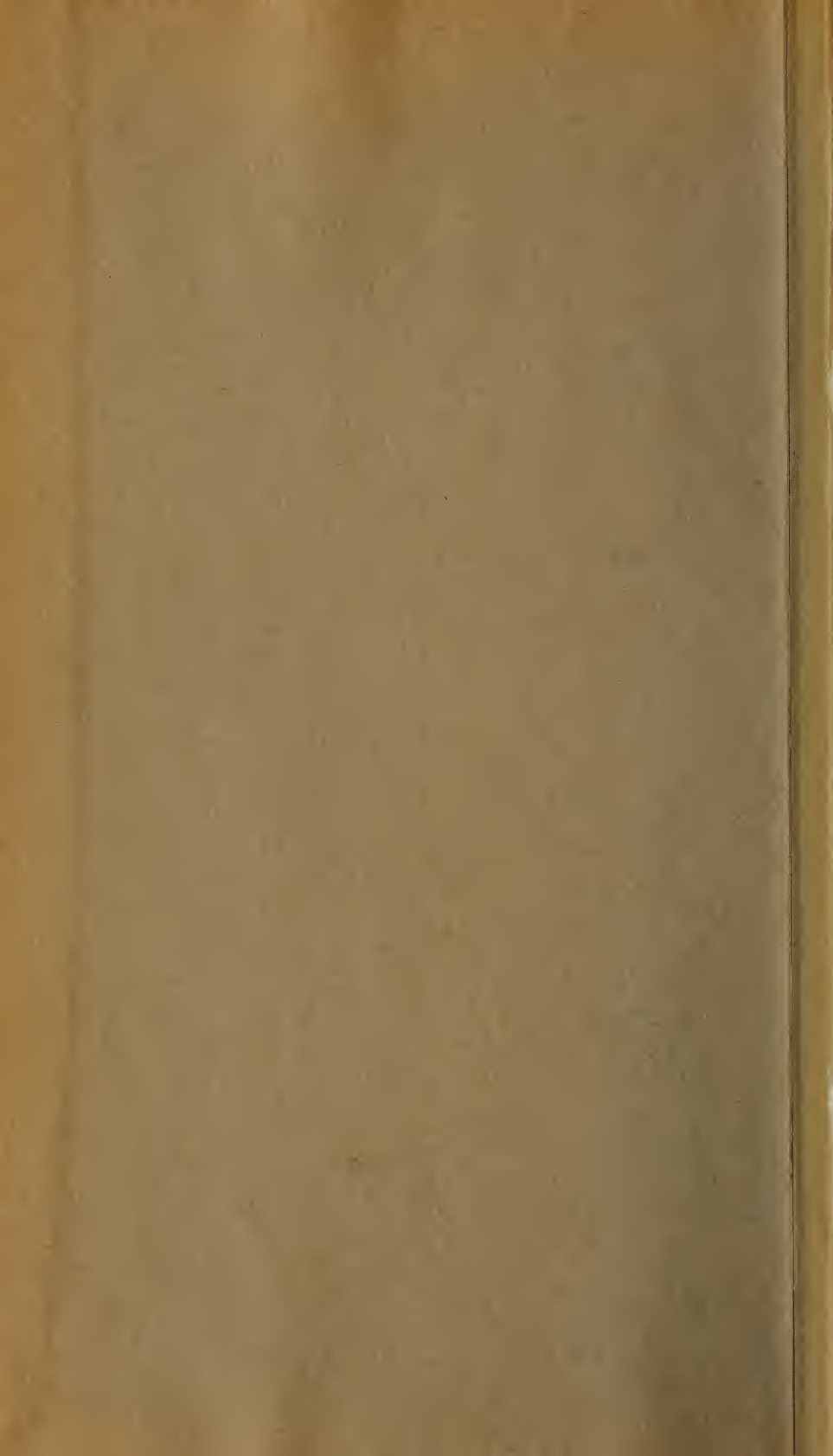
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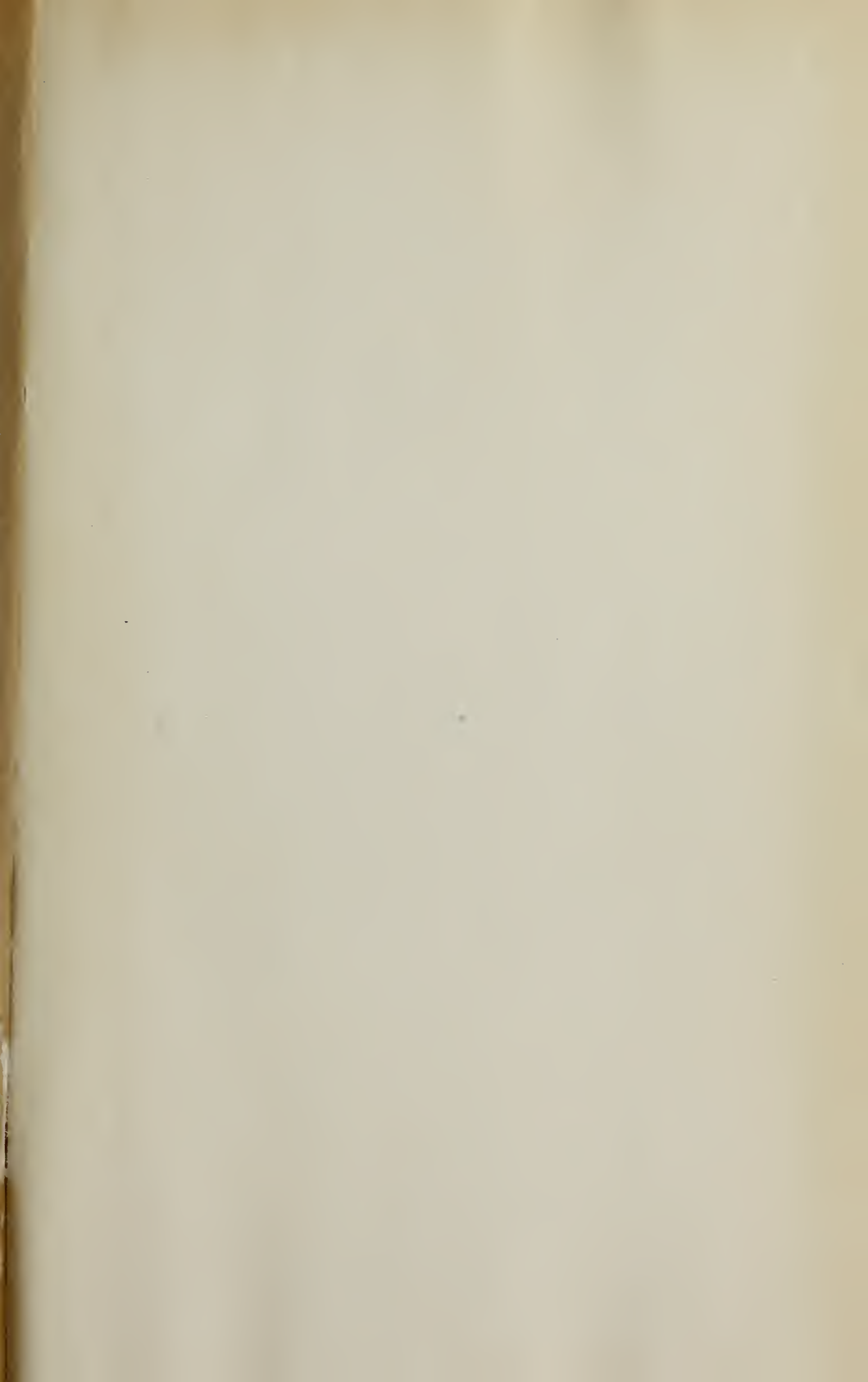
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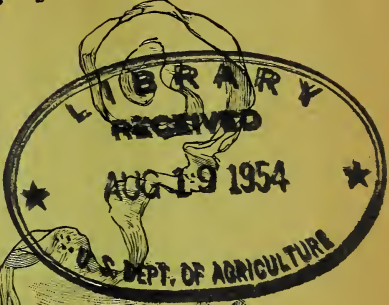
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GLEANINGS



A JOURNAL DEVOTED
TO BEES, HONEY,
AND HOME INTERESTS.

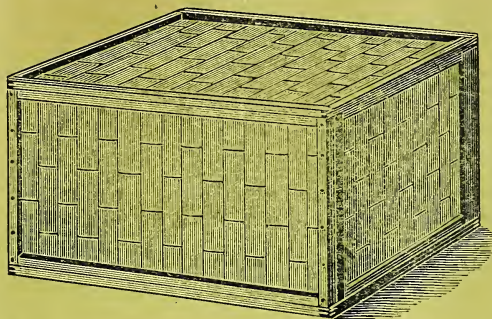
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GLEANINGS

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS.

BEE CULTURE

ILLUSTRATED
SEMI-MONTHLY
Published by THE A. I. ROOT CO.
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VOL. XXVIII.

JAN. 1, 1900.

No. 1.



It's FINE. This in answer to that first question on page 935. [Fine? what was fine? I had to look clear back to page 935. Thanks.—ED.]

ON PAGE 928 it is said that alfalfa "makes good honey." I think that's the first time I've seen any testimony that alfalfa was of value as a honey-plant as far east as Michigan, and I'm wondering whether it may not possibly be mixed up with alsike.

IMITATING THE BEE. "Why don't you take example from the little busy bee?" inquired the man of original ideas. "I do," answered Meandering Mike. "An' I want to call your attention to de fact dat about now is when de little busy bee lays off an' doesn't do no more work fur de nex' six months."—*Washington Star*.

THE *Revue Universelle d'Apiculture* mentions an offer of GLEANINGS of \$25 each for *dorsata* queens, and ardently wishes success to the enterprise, because in the hands of its American confreres *Apis dorsata* will not delay to multiply rapidly, and to reach Europe *Nous verrons*. [That offer is still good; but no one has taken it up yet.—ED.]

D. W. HEISE gives in *C. B. J.* his trick of getting unfinished sections cleaned out. At 4 P. M., set in the open only as many as the bees will clean that day, putting the sections at least 1½ inches apart in the supers. Don't remove till 4 P. M. next day, and then replace with fresh ones, and so on till all are done. All right, friend Heise, only I suppose you always put out a sufficient number. If the number is too small, they'll surely be riddled.

SOMETIMES we become so accustomed to errors in speech that we no longer recognize them as such. My good friend Stenog, to whom I look up as authority in general, has evidently allowed himself to fall into the lazy habit of confusing the sounds of short *o* and broad *a*, as in *not* and *all*. If he will look in the dictionary he will see that they are unlike; and if he will observe those who speak cor-

rectly he will find that they are never alike in "common talk." I can not say "not all olives" without a distinct dropping of the under jaw at the middle word.

R. F. HOLTERMANN says, p. 924, that, when the foundation is "removed from the bottom-bar a distance at least equal to the thickness of the plate and whatever was melted away from the wax sheet," that distance is too much for best results. With any foundation I have ever tried, that distance is too little, for the foundation will surely buckle unless there is space for a bee to crawl under, in which case the space will too often be left in the finished section. The remedy is to have a bottom starter.

W. H. PRIDGEN succeeds in giving a just-hatched queen on the same day on which the old queen was removed. Friend Pridgen, if you take a queen just hatched, one that has not been held in her cell, and put her in a hive where there is a laying queen, I think you will find that she is *always* kindly received without the removal of the old queen. The trouble comes when she attains a little age, perhaps a day or so old, when she begins to assert herself as a queen, at which time the two will no longer be tolerated under the same roof. [Correct, according to my experience.—ED.]

"DURING THE HONEY-FLOW, when breeding is heaviest, bees require most water," p. 922. May be so in some places and conditions, but the reverse is the rule here. When a heavy flow comes, the watering-places are largely deserted, and when you see bees again at the water you may count the flow is letting up. I suppose they get enough water for their needs, in the nectar. [Yes, doctor; but is it not true that, when bees are breeding heavily, they require the most water, irrespective of *where* or *how* they get it? And yet I think you are right in saying that the bees gather most water when the honey-flow is not on, especially when brood-rearing at such times is at its height.—ED.]

"A BEE-KEEPER who contemplates much moving of bees should adopt some sort of closed-end frame," page 920. Fixed-distance frames, friend Rambler, but not closed end for this gluey locality. [Right there, doctor,

I think you are just a little wrong. I have come to the conclusion that, where propolis is very bad, a closed-end frame is better than the Hoffman, and a metal-spaced one better than either. But there are right and wrong ways of using frames with closed uprights. I am inclined to think that such frames, close fitting—that is, those whose end-bars reach to within $\frac{1}{8}$ or $\frac{1}{16}$ of the ends of the hive—just room enough for easy insertion and removal—would work all right with you. I do not believe you ever tried exactly that; and if you have, you have not tried it thoroughly enough.—ED.]

W. A. H. GILSTRAP, p. 928, puts the annual consumption of honey by a colony of bees at 100 or 200 pounds. I think Doolittle puts it at 60. Quite likely it may be 40 pounds less in New York than in California, for in New York bees are nearly dormant for months. Pity we can't know somewhat definitely about it. [As you intimate, it all depends on where one lives. In Florida, and, in fact, nearly all of the Southern States, where the winters are more or less open, and the bees can fly every day, the consumption of stores is very much greater than in the North, where the bees go into their long winter sleep.—ED.]

L. STACHELHAUSEN raises a fresh question, p. 925. He says the bee begins field work when it is 18 days old. Tradition says 16. He also makes 34 days the life of a worker. Tradition says six weeks—eight days more. Mr. S. is a man who generally knows what he is talking about. Has he good ground for thus lightly treating the traditions of the fathers? [While there is a slight discrepancy in the actual time, yet they are near enough when we consider the influence of various conditions and localities. I could readily see that in Colorado, for instance, the average life of the bees would be shorter than here, for the reason that their honey seasons are much longer. Would not this alone explain the difference in the life of a worker?—ED.]

F. A. SNELL gives his bees a little smoke before carrying in cellar (p. 930). That smoke may do no harm, but I'd a little rather not have it. If they trouble about coming out, I wait till another time. If for any reason I don't want to wait, I throw against the entrance a cloth dripping wet. The bees back off from the cold thing, and in the cellar it can be removed with no bees clinging to it. [We winter now exclusively out of doors; but when we wintered indoors it was our practice to loosen the hives shortly beforehand, either from the hive-stands or from the bottoms, so when the hive was finally picked up to be carried, there would be no snap or jar; and if it was handled quietly clear to the cellar no bees would come out. Smoke was useful at times, and we always had a smoker lighted for emergency.—ED.]

GLADLY would I receive information from Wm. M. Whitney (p. 930), but I am obliged to say that one of the things that I know, if I know any thing about bees, is that, while there are conditions that will make the same colony produce sections whiter at one time than at another, the chief difference is in the

colonies themselves. I had some Punic or Tunisian blood among my bees, and those bees at any and all times made greasy-looking sections, no matter how white all the other bees were working. They were good gatherers, but their product brought 2 cents a pound less than the rest of my honey, so I couldn't afford to let their queens live. Last season No. 70, from first to last, made sections distinctly whiter than any other colony, although the material and conditions seemed the same for all. [Yes, I remember very distinctly that the Tunisian bees that we had made the greasiest-looking comb honey of any bees we ever had—greasy because they daubed it all over with propolis, giving it somewhat the appearance of honey that had been badly soiled.—ED.]

PROF. GASTON BONNIER made some exhaustive experiments, and found that, under precisely the same conditions in other respects, the difference of soil made a notable difference in the nectar of plants. White mustard gives more nectar on calcareous than on argillaceous soils, while buckwheat is the reverse. A good honey-plant in one country may be worthless in another. [Exactly so. Buckwheat is a reliable honey-plant in New York; but in this State it may or may not yield. Alfalfa yields immense quantities of honey in Colorado and Arizona, but so far as I know it has not distinguished itself in the East—partly because so little of it is grown. But did you ever know of a place where sweet clover would not grow, and where the bees did not work on it when in bloom? It grows, and yields honey in more States of our Union than almost any other honey-plant that is known, I believe; but in only a few localities does it yield enough to make a perceptible showing in the supers.—ED.]

I HAVE BEEN profoundly moved by that Home Talk, p. 943. Does the saloon power hold by the throat all those elected to make and to execute our laws? I solemnly promise that, so long as my life is spared, I will vote for no man who is not pledged against the saloon. Brother A. I. Root, will you join me? [Yes, and no. When a candidate is not likely to run up against the saloon question, I see no reason why he should necessarily be made to pledge himself. What I mean is this: There is danger in flaunting the "red rag before the bull" unnecessarily. This stirs up the animal, makes him fight, and harder to kill. Instead of shooting our ammunition away in every direction, and keeping almost continually firing, I believe in the policy of using and concentrating it at a time and place where it is most needed. There are many officers who have more or less to do with the liquor question. It is from them that I believe in securing pledges; and if the candidate does not stand for God and the right, work to defeat him, no matter what his party. That's what we have been doing.—ED.]

SOMEHOW a wrong impression seems to prevail, that, in getting bees to clean out unfinished sections, the bees must be allowed to get to them only gradually, as by giving a small entrance or putting in a dark cellar.

Not at all, unless the number of sections is too small for the number of bees. With sufficient sections you may put them out in the open without fear. I put them in cellar (it's a light cellar) because they can stay there safe from rain for several days. If I should put a single super in the cellar, the sections would be ruined. [Regarding that wrong impression, I take it that you refer to something I wrote in answer to Questions from Beginners. While you are no doubt entirely correct so far as it relates to the practice of bee-keepers of experience, yet it would hardly be wise to advise beginners in the same way, would it? There are certain cures for foul brood that work all right in the hands of a professional, but which would produce disastrous results with a beginner, and the same is true in regard to feeding back. The main thing to look out for is to give the bees enough honey so that they do not have to scramble and struggle against each other; but a beginner would hardly know how much to give.—ED.]

AMONG exasperating things, one of the worst is to have one's interest aroused in something and be told all about it except the very thing that will make the information of practical value. Mr. Editor, you've stirred up a lot of us about that new kodak, p. 935. Now tell us what it is and what it costs. Of course, we can't afford \$50 or \$100 for a kodak, but we like to know, you know. [The kodak that I referred to was the No. 4 folding kodak, listed at \$25, and it is capable of a great variety of work. The manufacturers have a larger instrument at \$35, but for my purpose the smaller one is more convenient, and quite large enough for any thing that I require for GLEANINGS. I believe that lately The Eastman Kodak Co., of Rochester, have made quite a reduction in the price of these cameras. Just how much that reduction is, I do not know; but you can ascertain by going to your nearest dealer, or, better still, write to the company itself, from whom you will receive a handsome souvenir in the way of a beautiful catalog. This is not a "paid puff," for the editorial opinions of this journal can not be bought in the interest of any concern; but we will gladly give, free of charge, a recommendation when we know that an article has real merit from our own knowledge and experience.—ED.]



Just gone is "eighteen hundred;"
Down the ages be there thunders
Praise for victories unnumbered
We have gained o'er space and time.
In the century just closing,
With its progress so imposing,
We have seen and heard and learned more
Than Methuselah in days of yore.

Just as the above lines were finished there were laid on my desk two books of poems by

Charles H. Crandall, one entitled *Wayside Music*, and the other *The Chords of Life*. They were sent us by that veteran bee-keeper L. C. Root, of Stamford, Ct., and his approval of such works is enough to commend them to others. I have read quite a number of the poems in both books, and as I became more acquainted with the spirit of the writer the better I liked to read his lines. The books are beautifully printed, neatly bound in cloth. The thoughts center around New England largely, and are beautifully expressed. I can't help saying, however, that a better punctuation could have been adopted in some places. For instance:

There are four little letters that live in my heart—
An L, and an O, and a V, and an E.

How much better the last line would read to have it,

An L and an O and a V and an E,

as the words are all equally connected by the conjunction!



BEE-KEEPERS' REVIEW.

Whew! what a number this is—50 pages! Mr. Hutchinson has outdone all previous efforts here by way of pictures. It baffles description. We have a view of Barnes Co.'s works at Rockford, Ill.—the men who make saw-tables, foot-power buzz-saws, etc. Here is a view of the residence of the editor, Mr. H., also those of the editors of this journal. But the list is too long to mention in detail. Send for a copy. Mr. Hutchinson's story of his struggles in getting a start is interesting and touching.



BEE CHAT.

This spicy and concentrated little sheet, published by Samuel Simmins, author of "A Modern Bee-farm," etc., Heathfield, England, is worthy of more notice than it has been receiving. In the issue for November the editor warns all against buying old stocks from discarded apiaries, as complications are almost sure to arise. "A large number of partly diseased stocks crowded together on a long journey generate the most fatal temperature for propagating the malady, and are sure to develop further evidence of disease at an alarming rate thereafter." Before buying discarded apiaries it is best to make a personal examination. Disregard of this precaution has just led to much acrimony between some of Mr. Simmins' friends, and their letters were so intensely personal that he could not print them. He well says, "It is sad to think what mischief is often done through want of thought."



As between foreign and native bees, a correspondent says the latter are nowhere in the race. He had nine foreign stocks in one group, and another man thirty natives in another, on the same ground. He called his neighbor to look at one of the supers, when the neighbor said, "I have nothing like it," while he himself had several as good. One black stock with a younger queen completed only one section. The natives would not touch foundation,

which the yellow race drew out freely, and he finds that the latter maintain a larger population in fall. He finds an Italian queen mated with a Carniolan drone better than any other.

“Native bees are decidedly more subject to foul brood than Carniolans or Italians; while the latter more readily respond to treatment when affected, and will quite frequently dispose of the malady without aid from the owner.” The editor says it is an undoubted fact that colonies will at times recover, not only without medical agents, but most certainly by treatment which aims solely at exterminating the complaint by causing the spores to germinate under conditions where they can not be reproduced. The whole matter, he says, turns upon racial vitality and energy. His first terrible experience with foul brood occurred over twenty years ago. The bees attacked were, with two or three exceptions, so-called black bees, and these could not keep the disease under. The Italians soon disposed of it with a little assistance; and upon removal of the queen every vestige of the complaint disappeared from the combs. On later occasions, in buying black bees from a distance the disease came upon him again, but at no time has he had any difficulty in keeping foreign stocks clean, while those bought were readily treated as soon as the queens were changed and the foreign varieties hatching out. On one occasion he bought a number of stocks from (as he then found) an infected source. Half were native, the rest Italian. The former were diseased, but none of the Italians. Are not these significant facts? At a convention held in Melbourne, Aus., Mr. W. Symes said he found black bees so much subject to foul brood that he despaired of getting rid of it; but since he introduced the Italians the disease has gradually disappeared, and has now ceased to trouble him. But it is idle to say that these strong races *may* not have foul brood.

OPPOSED TO LIGHT WEIGHTS.

The 10-cent Section a Detriment to the Business;
The Danzenbaker Hive and Section.

BY E. J. HAIGHT.

Please do not go into the booming and making of light-weight sections too fast, as the present high price of honey will not warrant the policy of a 10-cent box, in my opinion—that is, to retail for that. A section that will average 14 oz. or over will take no more work to prepare it for the bees to fill and to case it for market than a section weighing only $\frac{1}{2}$ or $\frac{3}{4}$ of a pound. Then the amount of wood, dry beeswax, etc., costs about the same on a little box as a 1-lb. box, which is so much more waste to the consumer for his money, as well as a waste of time and expense to the producer; in fact, the item of wax in a light thin section that the bees have to make is more than in a thicker one. I believe it would result in the loss of many pounds of honey to the bee-keeper.

I have sold more or less honey in Port Jervis, N. Y., for a number of years. Two years ago a certain class of dealers wanted and must have, as they said, a section they could retail for 10 cts. They did not care particularly how much it weighed. They wanted my light weights, and I had to sell at a ruinous figure, and a ruinous trade resulted, for they do not order any more. But another party who gave me a fair price for well-filled boxes buys every year, and handles an increasing amount; so I believe it is best for the bee-keepers not to go into the policy of a 10-cent box, as the present high price of honey will very much help us to get away from that standard. The increasing demand for honey, that every faithful bee-keeper is trying to stimulate by the aid of those leaflets and by the mighty power of the press, makes me think we had better keep that idea of a 10-cent box, which a great many times is confounded with 10 cts. a pound, out of sight. Some say, “Why, Mr. Jones is selling his very best at 10 cts. a pound, and you want 12 or 13 cts. No, no! I don’t want your honey. I can do better.” I have had this confront me many times; and a friend has just written me that light weights have hurt his trade very much. I think a nice Danzenbaker section, 4×5, that comes pretty near the 1-lb. mark, with a carton on, that can be handed out for 20 cts. retail in cities, or 15 cts. in country places—not less than that—will satisfy all parties best in the long run.

Now a word in regard to cleats on the inside of hives, and also supers. Do not make them of basswood, as they will swell so they are too tight. We had to dress off $\frac{1}{8}$ inch from each by hand last spring, so we could get them out at any time. Inside fixtures should be of pine.

I am pretty well satisfied with the Danz. sections and hives, except the fault above mentioned, as my Danz. section honey netted me (the No. 1 honey) 13 cts. loaded on the cars here, and No. 2 11 cts. cash. About $\frac{3}{4}$ of the Danz. sections were classed as No. 1 honey instead of No. 2—a big item.

Rock Valley, N. Y., Nov. 3.

[In all these questions we must not forget the bearing that locality has, and that individual preferences can not be made to harmonize. In Canada, light weights are sold almost exclusively.]

We are not “booming” light weights, nor have we been. We have simply called attention to them as being preferred for certain markets. You would think the “booming” of 4×5 Danzenbaker would be all right, when friend Ochsner (see page 752 last year) would think it “a nuisance to bee-keepers at large.” Mr. O. is a strong advocate of the 4×4 section, and he could not be made to see the matter as you do on the *shape* of the section, although he might agree with you on the light-weight question. Of course, if you were compelled to sell your heavy weights for light weights, that would be a sacrifice.

As to cleats in the Danzenbaker hive, that matter had already been brought to our attention, and is being rectified as rapidly as possible.—Ed.]



The Dead Bee.

Illustration By R. V. Murray.

By Alice Lena Cole.
IN CENTURY MAGAZINE.
OF MAY 1899.

1
Dead amid the dewy clover
Lies a bonnie little rover
Who could shape his course afar,
Without compass, without star.

2
Nevermore across the azure
Shall he sail in search of treasure,
Nevermore, when day is gone,
Home shall hie his galleon,

3
From the jonquils' golden chalice
And the lily's ivory palace,
And the violets' divine
Cups of white and purple wine.

4
Smile, smile on, thou faithless
summer,
To forget thine early-comer.
Say, if thou hadst first departed,
Had he still been merry-hearted?

5
On the boughs in rapture swinging
Gleefully the birds are singing.
I, who mourn thee, little Bee;
Will pronounce thine elegy:

6
Be it meetness or unmeetness,
Thou didst garner up life's sweetness,
Wiser than the sages wist;
Earth has one less optimist..

THE RICKE SECTION-FOLDER AND FOUNDATION-FASTENER.

A Simple, Cheap, and Practical Machine that any Mechanic can Build.

BY HON. J. M. HAMBAUGH.

I have the pleasure of mailing you photos of the new Ricke section-press and foundation-fastener, all in one machine. See Fig. 1. No. 2 shows Miss Maude Ricke, daughter of the inventor, Mr. F. W. Ricke, in the act of pressing a section which she has just folded from the

pile on the right. This is done by pressing a lever with the foot, which brings the notched block from above down upon the dovetailed section joints. The lever then being raised, the block is lifted by a coil wire, the spring of which can be seen at the top of the machine. This done, the section is simply removed and dropped down on the folder (see Fig. 3); a strip of foundation is placed in position, the folder pressed in, and the heat from the lamp, as seen in the cut, instantly melts, and as quickly fastens the wax to the wood, and the section is ready to set at once in its place in the super or section-case.



FIG. 1.—MR. W. F. RICKE AND HIS COMBINED SECTION-PRESS AND FOUNDATION-FASTENER.

The advantage Mr. Ricke claims with this machine is that it requires only one time handling of the section from the unfolded pile to the section-case, ready for the hive. With sections, cases, fences, followers, and wedges at hand, there need be no piling-up of folded sections, waiting to be rehandled to a foundation-fastener, nor is there any occasion for piling up sections with starters, to cause annoying mishaps, which is so trying to the patience. To minimize labor and lessen liabilities to mishaps, has been the object of the inventor; and if by this invention he has contributed something in that direction, he will consider himself amply paid.

Mr. Ricke says he can fold, press, foundation, and place in the super 4 sections every minute.

Mr. Ricke is a carpenter by trade, and quite an inventive genius. He has about completed a solar wax-extractor that, in our estimation, is very unique, and we may give the readers of GLEANINGS a glimpse of it soon. Mr. Ricke has recently purchased a fruit-ranch near our city, and is interested in bees to the extent of 32 colonies. His bees are in 8-framed Root Simplicity hives, with metal bearings and Hoffman

brood-frames. He is thinking of changing to 10-frame hives, however.

Escondido, Cal., Dec. 7.

[This appears to be a good machine. It is certainly better than *some* of the so-called combined machines; but whether it is equal to or better than the others, I can not say. We have been experimenting with quite a number of late, with a view of adopting one for ourselves, but as yet have not quite decided. Some good points are made above, to the effect that the section has to be handled but once; for that matter that is true of any combined (two in one) machine. But our man says that,



FIG. 2.—MISS MAUDE RICKE IN THE ACT OF FOLDING.



FIG. 3.—FASTENING THE FOUNDATION.

for quantity of work, we can beat any of them with two separate machines. While that may be true, because he is used to their handling, the *average* person would do more rapid work with a combined machine.

I should be glad to have you tell us further of Mr. Ricke's invention, especially of that solar wax-

extractor; and don't forget to send along some more good photos. From those in hand it is plain that Mr. R. should be (no doubt is) proud of his machine, and, and—its operator.—ED.]

SUPERIOR BREEDING-QUEENS.

Why the Queens of some Breeders do Not Come Up to the Advertised Qualities; Controlling the Parentage of Both Sides; Another Record-breaking Queen.

BY J. F. M'INTYRE.

I have never advertised queens for sale, but have bought queens from every breeder in this country who claims to have anything superior, and I am sorry to say that I am generally disappointed. Why is it that we are so often disappointed in buying the daughters of a queen claimed to be very superior stock? These daughters should be all that is claimed for their mother, and we are disappointed if they are not.

There are several reasons why the young queens may not be as good as we expect from reading the advertisement. First. The claims may be exaggerated; but I have charity enough to think that this is not where the trouble generally comes in.

Second. The young queens may not be as well reared as their mother was. I believe this is true in about ninety-nine cases in one hundred. We find a very superior queen in the apiary, probably raised under the superseding impulse, and start out to duplicate her by starting a large number of cells from her larvæ in a queenless colony, or in a super above a queen-excluder, which is about the same thing, as the bees regard that part of the hive as harmless; and the result is a lot of queens below the average in quality. To duplicate your fine breeder the young queens must be reared as close to nature's best way as possible. The Doolittle cells placed in the middle of a brood-chamber, where the colony is superseding its queen, or preparing to swarm, gives the best results in my hands, and the superseding colony is the better of the two.

Third. The young queens may not have married as well as their mother, and their children may inherit a lazy disposition from their father. As in the human family, this is a hard matter to control, but it is best done by raising an abundance of drones from an equally good queen in no way related to the one you rear queens from, and by killing inferior drones.

Fourth. Queens are often injured by long confinement in the mails, especially if they are laying rapidly when caged and shipped. When a queen comes out with a swarm she is in the best possible condition for a long journey by mail. The ovaries are then small, and not so liable to injury as when they are large and full of eggs.

Larger cages should be used for shipping valuable breeding-queens. The export Benton cage is none too good to mail a breeding-queen from the East to California, and the long-distance Benton is about right for all others.

This subject of superior stock is now the most interesting to me of any connected with the bee business.

I am interested in the statements made by Mr. Wright, on page 829, about a queen which he calls "Sweetheart," and would pay fifty cents more than the regular price paid for one of her daughter's select tested, and one dollar more if the young queen was reared in a colony superseding its queen and mailed in an export cage; and if you could insure her mating with a drone from as good stock as herself, which would make the young queen as good as her mother, you might add another fifty cents. Seven years ago I bought a queen from a man named Wallace, who advertised that he was raising queens from Dadant's best stock. I raised about twenty queens from this one to test the stock. The next season was a dry one, and most bees had to be fed to keep them alive; but several colonies out of the twenty filled their supers with honey. Next season, 1895, I bred from the best of these; and in 1896, which was another dry year, this strain again filled their supers when others were starving. I have had many colonies of this strain which I considered ideal bees, and think that they have been improved by breeding from the very best each year. The present year was a very dry one, but I have one colony of this strain that filled 2½ ten-frame L. supers; and I wrote in my record-book, after the number of this hive, that such bees would make a man rich. They are beautiful, pure Italians, light three-banded, queen large and yellow, and very prolific. I have raised about 200 young queens from her, and they are all like their mother. Her bees are gentle. She was one year old last July, and has never swarmed; and this strain does not swarm half as much as any other strain in my apiary. It is rare for me to become enthusiastic over a queen; but when a colony shows a marked superiority over 600 others in the same apiary, it is a rare thing.

Fillmore, Cal.

[You have very fairly and candidly set forth some of the reasons why queens of good mothers do not equal the original stock. It is true, that some of those (not all) that travel long distances in mailing-cages do suffer more or less from confinement, exposure, and rough handling; and that is one reason why I have been urging every honey-producer to learn to rear his own queens by the Doolittle method; and while referring to that method I agree with you, that those reared under the swarming or superseding impulse are much superior to those reared by the other plans. A colony that is about to supersede its queen we consider a prize; and if we can get four or five of them, we feel that we are in clover. But, of course, when we have no such colonies we use the next best—i. e., bring about the swarming impulse artificially by feeding a little every day; but even then an actual honey-flow is ahead.]

With regard to your breeding-queen, the one that has made such a fine showing, we hereby give you an order now for three of the best of her daughters, if you will sell them, to

be sent next summer, you to set your own price. We would make you an offer for the breeder; but, even if you accepted, by the time she arrived here through the mails she might be almost worthless as a breeder, especially if she were getting to be old, and it would not be wise to take chances on such a queen.

Yes, sir; when one colony shows such marked superiority over 600 others in the same apiary it is indeed a rarity, and that queen is a prize. I hope you will supply other breeders with your stock as well as ourselves, for the time is surely at hand when better honey-queens rather than better colored ones should be sought.—ED.]

TALL SECTIONS.

How to Get Bees to Take the Honey out of Supers; Smoker-drippings, and the Remedy.

BY J. E. CRANE.

My Dear Ernest:—I have been wanting to write you for a long time on several matters; and as this is the season of mince-meat, perhaps it would be a good time.

1. In regard to the use of separators with projections, a year ago you thought you might be able to introduce them this winter. I had hoped that the past season I might be able to prove very conclusively their value; but the season was one of the worst I have ever known, my bees averaging but one pound of surplus per colony; yet these separators with projections have given very satisfactory results. I think as large a proportion of sections were sealed up and down the sides as I have had for many years, although I did not get a single clamp finished. Still, under the circumstances I think it would be better to leave the matter for another year, when I shall be able, I hope, to speak more positively as to their value.

2. On page 766, Oct. 15, Louis Moll speaks of using sections $4\frac{1}{4} \times 5\frac{1}{4} \times 1\frac{1}{4}$ as I had some time suggested as being quite too thin. I think I must have had in mind plain sections. I made several thousand last winter $5 \times 4\frac{1}{4} \times 1\frac{1}{4}$ plain, and they prove very satisfactory. I have just weighed five such; and although not perfectly filled they averaged $14\frac{1}{2}$ ounces in weight. A plain section $1\frac{1}{4}$ thick is almost exactly the same as $1\frac{3}{4}$ with a bee-space.

3. I see you and Dr. Miller have a good deal of trouble in getting the bees to take the honey out of sections in a super. Now, the way to do it is to uncap all that is capped, either with knife or by scraping the cappings, and laying the combs down flat instead of in a natural position, then bees will quickly remove the honey. However, I think where one has many unfinished combs the best way is to uncap and put them into the extractor and then give to the bees to clean up.

4. In regard to the smoker dripping, I long ago learned that, in the burning of wood, either wet or dry, a large amount of water is generated. A large part of dry wood is composed of oxygen and hydrogen, and in combustion these unite, forming water. If you

lift a griddle of the kitchen stove soon after starting a fire in cool weather you will find the under side covered with moisture condensed by the cold iron. We shall also find, where a stovepipe extends a long distance, or through cold rooms, a tendency to drip. The dripping of smokers will be found much worse in a cold day, or in a damp cloudy day, than in clear warm weather. If you use dry fuel, of course there will be less than when damp fuel is used. So far so good. But this is not a complete remedy. If the inside of the smoker is well lined with soot it helps; but even this will sometimes fail.

The only complete remedy, so far as I know, or at least the most practical remedy, is to make a hot fire in the smoker when troublesome, and then the heated air does not readily condense on the inside of the smoker. A cubic foot of air at 10° Fahrenheit will hold $\frac{1}{10}$ of a grain of water in suspension. If the temperature is increased to 30° it will hold 2 grains. If raised to 70° it will hold 10 grains, and at 100° 19 grains, and at a temperature of 212° many times this—if I remember correctly, several ounces. The ability of the air to hold moisture increases very rapidly as the temperature rises. From this will readily be seen the advantage in damp or cold weather of having a decidedly hot draft through the smoker, thus keeping the sides of the nozzle warm, and the smoke and air hot enough to hold all the moisture generated or given off in combustion.

In the Dec. 1st issue of GLEANINGS Dr. Miller has a Straw relating to a new linden—*Tilia petiolaris*, two weeks later than other lindens. Does this mean that it is two weeks later than the American or European linden? The American linden blooms about two weeks later than the European.

Middlebury, Vt., Dec. 5.

[I should be glad to hear more about these big sections. They must look like great slabs of honey. Better not send any of these around in Danzenbaker's territory or he will be around after you with a sharp stick, for his 4×5 would have no show.

I have tried laying combs flatwise on the brood-frames, and I now remember that the bees did take the honey out of them; but as it would be a great deal of work to take the sections out of supers and lay them down, perhaps the best way is to let the bees rob them out, as explained in Straws in this issue.—ED.]

RAMBLE 180.

Rambler's Inventive Genius at Work; How he would use Hypnotism in place of Smokers for Bees.

BY RAMBLER.

"Well, Rambler," said the boss as we sat at ease in his cabin, "you seem to be doing a land-office business in the line of improvements. Your head must be full of them. Now suppose you tell us about the next thing we may expect."

"There, now, Mr. Boss, you have no idea that I am going to reveal the workings of my genius? Then I am sure if I should you would meet them with words of doubt and derision. Now, here is Mr. Gabfast; he and I have been comparing notes. He also possesses a great amount of genius, and has an idea in his head that is worth looking after."

"Hey? how is that, Mr. Gabfast? If you have any thing new, give it to us," said the boss.

"Oh! I am not giving away ideas any more than is the Rambler; but, after all, as the idea does not give away the construction of the thing, I have no objection to state the bare idea. I have in mind a practical machine for uncapping honey."

"Pshaw! is that all?" said the boss. "Why, I have studied that matter myself in all of its phases, without tangible results; and if I could not invent it I am sure you can not. It can not be done, Mr. Gabfast; then if it could be invented it would soon be worthless, for the tendency of the times is to extract the honey before it is capped. Why, Mr. Gabfast, your time and your money are all fooled away in the study of it."

"See here, Mr. Boss," said I; "you are altogether too extreme in your conclusions. The tendency is not for extracting honey before it is capped. If so it is a tendency for thin unripened honey. It is an uncontrovertible fact that honey ripened in a tank is not equal to honey ripened in the comb in the hive; and if the general run of bee-keepers

adopt the non-sealing plan, our product will not command the favor it has in the past."

"Them's facts," said Mr. Gabfast, with a beaming smile toward me. "The more I keep bees, and the more honey I extract, the more I want it sealed, and the more I need a good uncapping machine; and just because I am driving a team during these poor honey seasons it is no sign that I can not invent new machines. I'll show you, Mr. Boss, that my genius is not to be sneezed at. Do you *sabe*?"

"Oh! well, if you fellows are going for me in that way I'll take off my coat and argue it to the end. I never give up in such matters. Do you *sabe*?"

"Yes, we *sabe*," said I; "we have no desire to argue; it is unprofitable business; our works hereafter will show our position; but now as we have gotten into the comparison of ideas, let me give one. I believe the day is coming when the smoker will be an obsolete tool in the apiary."

"You don't say so, Rambler? Why, how are you going to subdue the pesky bees without smoke? Is it gas, anesthetics, odors, or what?"

"None of them, sir, but purely science. You know the tendency of the times is to the annihilation of time and space, and man is just learning to understand the wonderful possibilities of his mind. The day will come when the bee-keeper can approach the hive and make a few passes over it, and the bees will become as tame as flies; and in order to introduce a queen, just make a few passes, and



both bees and queen when put together will immediately meet in harmony. In other words, we will hypnotize instead of smoke bees."

"Ha, ha, ha! Why, Rambler, ha, ha! why—ha, ha! what a cranky idea! Why, Rambler, you have more cranks and wheels in your head than a thrashing-machine. Say—ha, ha! I'd like to have you try some of your passes upon *my* bees. Say, Gabfast, don't you think that is the most outlandish idea you ever heard of?"

"No, I don't," said Gabfast. "I believe the Rambler is right in his deductions. In these days of great discoveries, the thing that seems a chimera to-day becomes a working fact to-morrow; and then Rambler has good authority to back him."

"Well, I'd like you to quote your authority. I believe I have read all the works upon bee-keeping that are worth reading, and have never found where hypnotism was ever mentioned for the management of bees."

"Well, I will quote from one of the oldest bee-books extant," said Mr. Gabfast. "'The sucking child shall play on the hole of the asp, and the weaned child shall put his hand on the cocatrice's den.' Now, the bee is not mentioned; but it is implied that the venom of the bee will not be used; hypnotism and suggestion will rule in that day. Oh! yes, Mr. Boss, the Rambler is right. You didn't know he was a hypnotist, did you?"

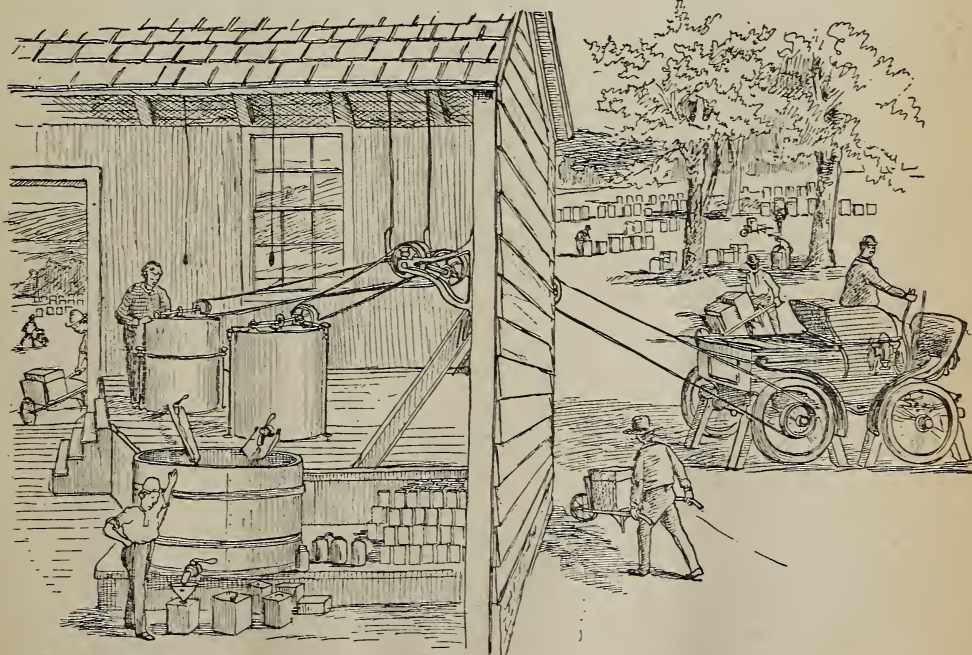
"Well, no," said the boss; "but I might have known it; seems he did not ride with you for nothing last night. He seems to control you."

"Now, my dear boss," said I, "in order to prevent our conversation taking a personal

turn I will launch another idea at you. The proposition is this: *The automobile will revolutionize the bee-keeping industry.*"

The boss and Gabfast were both silent for a few minutes. I didn't know but the idea had overwhelmed them; but utterance was soon given them, and they both expressed themselves as favorable to the automobile for the moving of bees or in any other work around the apiary where horses now are used; but as to revolutionizing the industry, the boss thought that was another wheel in my head. "But give us a few more of your ideas upon the matter," said the boss.

"As you have said, gentlemen, the automobile will supersede the horse in the moving of things to and from the apiary, and every thing in and around the apiary; in fact, it will enable us to get around among the hives if we need to. The first requisite will be to locate the apiaries near to good roads; and now that the automobile has arrived, the good roads will soon follow. We can now save time over the horse on our bicycles, and the automobile will enable us to save time with our loads of fixtures. We can even fix to move bees rapidly to out-locations when desirable, also to move honey to market. And you know that many bee-keepers have time and genius to make their own hives and fixtures. Jack up the automobile so that the wheels will not touch the ground; now attach an adjustable pulley to one of the wheels, and the power can be used to run a circular saw or any other light machine. When not used for sawing, the pulley is quickly taken off, and the automobile will be ready to use for its original purpose. In colder portions of the country where the auto-



mobile would stand idle for many months in the year it could be used to advantage in running not only the saw but the washing-machine, churn, or sewing-machine. Then, Mr. Boss, it will readily occur to you that, when the extracting season arrives, the automobile can be run up to the honey-house, and the power attached to the honey-extractor."

"Yes," said Mr. Gabfast; "and you don't want to forget to attach a belt to my uncapping-machine, for that will run with a pulley."

"Glad you spoke of it. All these machines help: every thing that enables us to work with rapidity reduces the cost of production. With the automobile for power, a greater amount of honey could be thrown out in a day, and with less help. Then to avoid lifting cases and barrels of honey a crane could be so arranged as to use the power from the automobile. Bee-hives, when moving an apiary, could be handled the same way."

"Well, I declare!" said the boss; "that was vone grand schemes," and he enthusiastically sang:

"I ish one of dose happy bee mans,
I don't got to vork any more;
I loafs all day on der apple-dree shade,
And shmokes mine pipe on der door."

"Hurrah for the automobile!"

"Say, boss," said Mr. Gabfast, "I saw the Rambler make a pass at you a few moments ago—guess you are under his influence, hey? I didn't get so far off my base as to sing Dutch."

"Now, gentlemen, do not get too enthusiastic. I have another good feature, better than all the rest. Now listen. When the honey season is over, and we wish to sell our honey for a good price, fit up a real nice ornamental truck having glass sides; fill this with a nice lot of honey; trail it behind the automobile, and circulate with it through the streets of your towns, both large and small, far and near, until you dispose of all of your honey; then speculate a little and sell honey for those who can not run an automobile. The chief drawing feature about this honey-wagon is the phonograph or gramophone mounted on the top. Let the gramophone do the talking and singing while you hand out the honey for the dimes. A gramophone arranged to sing that Dutch song that you have just been singing, Mr. Boss, would be extremely appropriate; and, say, wouldn't it draw a crowd?"

"Ha, ha! I should say it would," said the boss. "Why, just the automobile itself would draw a crowd; but then I suppose they will soon become so common that they will attract but little attention. I will vote for the gramophone. They are always in order, for they can be made to talk and sing something new and to the point."

"You fellows can have your gramophone if you want it; but as for me I have done all of my own talking so far, and feel perfectly well qualified to do it yet," said Mr. Gabfast.

We both agreed with him on that score, for we believe he could tire out a gramophone any day.

"But, Rambler," said the boss, "I have

found one serious objection to the automobile, and that is the expense."

"I am aware of that; but you know that, a few years ago, we could not purchase a bicycle for less than a hundred dollars, while now we can get a very good wheel for \$25. It will be the same with the automobile. It is my opinion that a good machine propelled by gasoline, suitable for the bee keeping fraternity, will shortly be built for \$200."

"Gentlemen, I am heartily in favor of the bee keepers' automobile," said Mr. Gabfast; "and I move that we petition the A. I. Root Co. to find us such a machine; and if they fail to find one, manufacture it themselves."

The boss seconded the motion, and it was unanimously carried, and the A. I. Root Co. are notified to govern themselves accordingly.

Our meeting broke up with a hurrah for the automobile, and Mr. Gabfast went to his blankets in his wagon, singing, "I ish one of dose happy bee mans" And who wouldn't be a happy bee keeper with such a bright future ahead?



SOMETHING ABOUT CELLAR WINTERING OF BEES.

Question.—This being my first experience in wintering bees in the cellar, I am not sure whether they are doing as well as they should or not. Will you please tell me how bees should appear, to be wintering well?

Answer.—This used to be a point which bothered me considerably when I first began to winter bees in the cellar; and had it not been for the instructions on this subject given me by Mr. Elisha Gallup, in the *American Bee Journal*, and privately, I might have made many more mistakes than many beginners now do. In the first place, when hives are placed in the cellar they should be raised at least two inches from the bottom-board. As the years go by, I am led to believe more and more that this was one great reason I did not succeed better in my first efforts in wintering bees in the cellar; for at that time I almost invariably left them down on the bottom-board as in summer, and often with the entrances nearly closed, for it was thought then that something must be done so as to keep the bees in the hive during their sojourn in the cellar. But, to the question: "How do I know when the bees are wintering well?"

To best illustrate I will give something which happened some years ago, as I have it in my diary. A neighbor called to see how the bees were wintering, and to know how I fixed them and the cellar. I told him that my bees in the cellar were wintering well, as I considered it—in fact, I had never had them appear so nice and quiet as they were then appearing that winter in the cellar. After some little more conversation I asked him if he would like to go into the cellar, to which he

answered that he should very much, but said, "I suppose you do not go into the cellar from the time the bees are put in till you take them out, as I see it advised in some of my papers that it is not best to do so." I told him that I went into the bee cellar whenever I wished so to do, and I did not consider that any harm resulted therefrom; and I am now sure, after more than a score of years of cellar wintering, that no really scientific wintering of bees can be done where no observations are ever taken.

As we were going into the cellar a conversation about like this took place, which I will give, as that will help the questioner to understand that which he wished to know better than I could do it in any other way.

"What! have you four doors to go through to get in?"

"Yes, these four doors inclose three dead-air spaces, so that the cellar is kept at a more even temperature than could possibly be obtained in any other way, and the temperature is the main thing to be looked after in cellar wintering, after the bees are put in. Now, before we open the last door I wish to say that we must be careful not to jar any of the hives or breathe on the bees, for we should be as careful not to disturb them as possible."

"What is that low murmuring noise I hear?"

"That is the contented hum of the bees in their winter repose, and you can always know that they are wintering well when 60 to 75 colonies make no louder noise than you now hear."

"But I supposed from what I had read that bees, when wintering well, gave no sign of life, not even any noise."

"In this you are mistaken, for I have never seen bees in such a dormant state but that they could stir to a certain extent—enough to give off a loud buzz when the hive is suddenly struck, or to thrust out the sting if they are breathed upon."

"Hark! there is a bee flying. Do they fly out here in the dark?"

"Yes; that is only a bee ready to die of old age; and as instinct prompts the old bees to leave the hive to die, when the temperature will permit it, this bee is only obeying nature's law in flying out. See! here are quite a few on the floor, but not nearly as many as is the average in most winters. I often come in here in the dark, and listen for these old bees; and many times before, in previous winters, from two to five would fly out while I was slowly counting 100; but this winter scarcely more than one comes out while I am counting from four to six hundred."

"What have you on the floor here—sawdust?"

"Yes, every two or three weeks I bring in a bushel or so of fine dry sawdust, such as I make when running my saws in the shop, and scatter it on the floor. This sawdust will absorb almost its bulk in moisture, so I leave it here to keep all as dry, sweet, and nice as possible. Before I used this the dead bees on the floor would mold and smell badly; but now all smells sweet and nice, very little mold ever appearing."

"Here is your thermometer. I see it marks 45°. What are the extremes of temperature in here?"

"From 43 to 47° above zero after the first few days when the bees are put in. The arousing of the bees in putting in, causes them to maintain a slightly higher temperature for a few days, up to 48 to 52°, but it soon subsides to where you see it now."

"What! doesn't a warm spell in winter, or a long cold spell, have any effect on the temperature in here?"

"No; and a cellar that allows the outside temperature to affect to any considerable extent the inside I have always considered as faulty. You will notice that there is a roof of stone over here. On top of these stone there is three feet of dry earth, and a board roof over the whole, which, with the four doors, is conducive to an even temperature. Now step up and look at those yellow fellows as the cluster hangs below the bottom of the frames nearly a fourth as large as the crown of your hat. And, again, look at them as I roll back the quilt at the top. See! they go from the bottom to the top of the hive."

"Why, Doolittle, they are dead."

"No, I guess not."

"But they don't stir."

"Let us breathe on them the least bit."

"They are alive, that is a fact. Do they always keep thus quiet?"

"I have never seen them more uneasy this winter; but some winters the light seems to arouse them, when I let it shine on them from below, and they will stir around considerably at the top when the quilt is lifted."

"Where are your ventilators? The piece I read said it was necessary that the cellar be rightly ventilated at all times."

"When I built this cellar I had a sub-earth ventilator 100 feet long, and an upper ventilator to match, but I gradually began closing them till I finally kept them shut all of the time, and I could not see but the bees did equally well without them; so when I remodeled the cellar they were left out of the plan altogether. Enough air seems to come through the earth and mason work, together with the doors, to supply all their needs."

"Well, I should not have believed that the air would keep so pure if I had not come in here and tried it for myself."

"We will go now; but first notice that the bees are nearly, if not quite, as quiet now as they were when we first entered, a quarter of an hour ago. If our entering does not disturb them more than this, why should I not have the privilege of coming in here as often as I think I can benefit them by so doing?"

In the above I have tried to make all plain to the questioner. If I have not done so, if he will tell me wherein I will try again.

[Doolittle's bee-cellar is illustrated in the A B C of Bee Culture, under the head of Wintering. It is a repository entirely independent of any other building above. The trouble with the average house cellar is that the walls above ground are too thin, and as a result outside temperature does have quite a decided effect on that inside.—ED.]



[I solicit questions for this department; but they must be put on separate slips of paper, and marked "GLEANINGS Department." If you desire an immediate answer, say so at the time of writing, and a private reply will be sent you in advance before your question with answer appears in these columns; but questions that are mixed up with business matters, will not only be subject to considerable delay but possibly will receive no answer at all.—EDITOR.]

PROSPECTS ENCOURAGING FOR NEXT YEAR.

November was very warm and pleasant, and bees carried water until the last day of the month. Dandelions and strawberries bloomed. If late rearing of bees is indicative of successful wintering, we may have no fears for the future.

The crop of surplus honey was light, but the lower stories were heavy with well-ripened stores and plenty of bees. There was a very small amount of white-clover honey secured in this locality—mostly Spanish needle and other fall flowers. Comb honey retails for 20 cents per section. MRS. L. HARRISON.

Peoria, Ill., Dec. 14.

FOLLOWERS IN TEN-FRAME HIVES.

In the use of your ten-frame Dovetailed hives, is it the general practice or intent to use the follower in addition to the ten frames? Seems to me the follower would cause too tight a fit. If the follower is not used, I presume the two outside frames are spaced equally from their respective sides.

Ashland, Or., Dec. 6. E. A. HILDRETH.

[As the ten-frame hives are made, they are wide enough to hold 10 Hoffman frames spaced $1\frac{3}{8}$ in. from center to center, but not a follower at the same time. But the latter is sent along so that, when less than the regulation ten frames are used, the follower may be used to reduce the capacity of the hive.—Ed.]

HONEY FROM PINE-NEEDLES THE MOST SALABLE.

The most salable honey I ever tried to sell was some gathered from pine-needles in May, 1898. Some of my best colonies began work in the third super at that time. When bass-wood and cotton-blossom honey was offered, later in the season, some of my customers refused to buy unless I could supply them with "May honey."

Let us have the reform in spelling, then the metric system of measures and weights.

J. T. ETHEREDGE.

Delray, Tex., Dec. 9.

POOR COMB HONEY ON A PAR WITH THE FANCY ARTICLE.

If E. R. Root could see some of my sections I suppose he would class me with the "farmer-bee-keeper." Now, I don't think that E. R. is sitting at his desk polishing his finger-nails, waiting to hear from me, so I will just say, that, in this part of the country, we are paid 9

or 10 cents per section, no matter whether the wood is white as snow or black as ebony. I have tried snow-white sections, and colored cartons, to make an attractive package easily handled by the merchant, but I could get no more for it than the man who brought his honey in an old tin can.

J. A. RUFF.

Fort McKavett, Tex., Nov. 30.

SIX THOUSAND DOLLARS CLEAN PROFIT FROM THE BEES.

I was in the bee business eight years, and received much valuable information from GLEANINGS that helped make my business a success. I commenced the business without knowing any thing about bees, and was in the business eight years, and cleared \$6000 in that time, after paying for the bees and all the supplies and labor hired. I liked the business, and it paid well; but I got to be 65 years old, and two years ago I sold my bees, as I had 1000 acres of land in cultivation, and 500 head of cattle, and am a director in the Poudre Valley Bank. I did not allow my bees to swarm. I took out the queens in June. I ran about 260 stands the most of the time.

N. C. ALFORD.

Fort Collins, Colo., Nov. 20.

[This illustrates the fact that, if one can make money keeping bees, he can make money at other things. The Cogshalls make bees pay as well as every thing else that they have a hand in. This is a better record than many are able to show who run bees as a sort of side issue, as I take it our friend above did.—Ed.]

WINTERING BEES IN THE TEMPERATURE OF A LIVING-ROOM.

1. Is it possible to raise bees in a temperature of 70° throughout the winter, with a small enclosure on front of hive, 2 feet long?

2. Can I raise young bees by doing so? And if I can, what can I substitute for pollen in the hive? This is an experiment on my part, partly because I haven't a full swarm.

CHAS. E. SELCHOU.

Port Chester, N. Y., December 6.

[1. It is possible to winter bees in a temperature of 70° throughout the winter, but it is not practicable, and losses from bees flying out are very considerable. Much better results can be secured by putting bees in the cellar, where they will get into that semi-dormant state when they will consume very little stores.

2. Yes, you can raise young bees, but this also is not practicable. If you wish to carry on experiments for the purpose of observation and study, put a colony in a greenhouse, where the bees can get natural pollen; but even then many of them will die by bumping against the glass; but in time some of them begin to learn that they can not get through the glass, and make their way back and forth to the hive. The whole trouble with wintering bees in a temperature of 70 degrees, and yet giving them an entrance to the outside, is that too many of them fly out and die; but if it is cold, and they have to hug up to the combs, they will not then fly out.—Ed.]



WE are having good stiff winter weather; and if it should continue long it would be rather hard on outdoor bees.

THE steady increase in our subscription-list is seen by an equal increase in our advertising. This is as it should be.

DOOLITTLE has a seasonable and valuable article in this issue for one who is just trying his luck at wintering indoors. To know when bees are wintering well in the cellar in spite of appearances to the contrary, is important.

SECTION-PRESSES and foundation-fasteners, either singly or combined, are getting to be very numerous. Many are good, and just now we are trying to decide which ones, from the point of economy and efficiency, are best.

MR. LEAHY, of the Leahy Mfg. Co., of Higginsville, Mo., writes that he has just completed arrangements with James Heddon, of Dowagiac, Mich., for the manufacture of his divisible-brood-chamber hive. Those interested can obtain these goods of Mr. Leahy or of Mr. Heddon.

ANSWERS TO QUESTIONS.

DURING the coming year more space will be given to answers to questions; but those who send in all such must not expect immediate replies, nor that the same will be published in the "very next issue." The questions should be separate from matter intended for the business department, written in good clear hand, and numbered. Those that are not of sufficient importance to the general reading public will be answered privately. Indeed, we answer scores of letters almost every day that have no reference to business, but are simply designed to help out beginners.

REQUISITES FOR INDOOR WINTERING; TEMPERATURE; WARMTH OF MOTHER EARTH; FOOD; VENTILATION; SUB-EARTH VENTILATORS DISCARDED.

In the November *Review* appears quite an extended article from the editor, on bee-cellars and their construction. After referring to the fact that the majority of bee-keepers in northern climates have found that indoor wintering gave better results than the outdoor, and that it is cheaper to gather a lot of hives together under one general protection than surrounding each individual colony by some material that is a poor conductor of heat, he goes on to say that a cellar of itself does not create warmth; but by being close to Mother Earth it derives heat from that source, and that an up-ground building can be made a success only when a large number of colonies can be placed in it; because the bees themselves will then be able to generate considerable heat.

He then states the gist of the matter in the following sentences:

This whole question of cellar wintering is one of temperature. Don't understand me as saying that temperature is the only thing to be considered in the matter of successful wintering, as there are several others; among which is that most important of all—food. What I mean is that ventilation and moisture have but little bearing only as they affect temperature. In a dry atmosphere bees can endure a much lower temperature than they can in a damp atmosphere.

It is well known that outdoor colonies will stand a greater range of temperature than those confined in the cellar; and the only reason I see why this can be true is because the outside air, when it is very cold, will of necessity be very dry; that is to say, the outside temperature of frozen air, even down to zero, with a dry atmosphere, will probably be no more destructive to bee-life than the inside temperature in the cellar, where there is a large amount of moisture, down to the point of 35 or 40 degrees Fahr.

Say as much as we like, cold is the principal agent that causes dysentery. Bees never stain their hives up in warm weather; and an apiary badly attacked with dysentery will be cured just as soon as warm weather sets in; but when we admit that cold is the prime cause of dysentery we must also admit that moisture, an excess of it, has a good deal to do with the matter; but an excess of dampness alone, if the temperature can be controlled at the right point, will not cause winter losses.

REQUISITES FOR INDOOR WINTERING.

We have had reports of how bees wintered successfully in cellars reeking with dampness, with water on the cellar bottom. Indeed, almost every good bee-cellar has more or less moisture arising from the breath of the bees that collects on the stone walls or on the stone roof if there is one. And, again, bees have wintered very successfully with windows closed tight with scarcely an inlet for fresh air.

There was a time when sub-earth ventilators were considered quite necessary to the successful working of a good bee-cellar; and for the benefit of our new subscribers I will explain these were nothing more nor less than wooden pipes about a foot square, or tile or sewer-pipe, running under ground for a distance of 100 or 200 feet, one end of which communicated with the outside air, and the other end with the cellar. The theory of a sub-earth ventilator was very plausible. The outside air at a zero temperature, it was argued, would enter the duct, where it would be warmed in its passage under ground to the cellar, up to about 40 or 45 degrees, which, on entering the cellar, would not chill the bees like the cold air directly from outdoors in the usual way.

Notwithstanding the fact that a good many sub-earth ventilators were made twelve or fifteen years ago, we hear very little about them now; and yet bees winter better nowadays than they did formerly when their owners thought they knew all that was possible about bees. They did not realize the force of Josh Billings' question, "What's the use of noin' so much when so much you no ain't so?"

But sub-earth ventilation, when *intelligent*-

ly used, may be productive of good results. Dr. Miller is one of the few who are believers in such ventilators, and would not under any consideration dispense with them. In each of his cellars he uses a small hard-coal stove, and when the bees become noisy, as a result of low temperature or bad air, he starts a fire, thus causing fresh air to be sucked in at the sub-earth ventilator. After the building of a small fire a circulation of air is begun, and the bees soon quiet down. How much of this is due to the fact that the temperature was too low, or to the fact that the air was foul, or to both, no one can state definitely.

It follows, then, if the sub-earth ventilator, when used intelligently, is a good thing, when handled carelessly it may be worse than nothing. Under some circumstances it is easy to see how it might bring in too much cold air, and reduce the temperature below the point of good wintering—down to, say, 40 or even 34. Under other circumstances it may be the means of causing drafts; and whether or not bees are affected by such things as are human beings, is not easy to say. But certain it is, there is some combination of circumstances resulting from the use of sub-earth ventilators that is not always attended with the results looked for.

Bees have been wintered successfully in up-ground repositories as well as below ground. The former will have an advantage in the way of dryness, but will have extremes in temperature, because Mother Earth will not be able to impart her heat to the room in which the bees are. But if the up-ground structures have a large number of colonies, the inside heat generated by the bees themselves, as Mr. W. Z. Hutchinson says, may be sufficient to keep up the requisite temperature. But, say what we may, it stands to reason that the up-ground buildings will be subject to a greater variation of temperature than those under ground.

The temperature of Mother Earth is somewhere in the neighborhood of 45 or 50 degrees—at least in this locality. I have run thermometers down in different wells all over our town. The thermometers were placed in a pail, the pail let down into the well and into the water. It was then raised and lowered for the purpose of changing the water so that the thermometer would be brought to the exact temperature, or as near to it as possible, of the water in the well. The pail was then raised, and a reading taken off immediately. This was tried on, I think, some six or eight different wells in this town, with the result that the temperature varied anywhere from 45 to 50 degrees. During the following summer I took further readings, and found that the coldness of the water of these same wells remained practically the same, thus proving that snow and ice above ground had very little effect on the earth 20 or 30 feet down. But water from soft-water cisterns varied greatly. Sometimes the water was very near the freezing-point in winter, and in summer it was away up to 65.

If our winter repositories could be down in the ground some 20 or 30 feet, we should be able to get a temperature that is almost uniform throughout the entire winter. But that,

of course, would be out of the question. The nearest we could arrive at such a point would be found in some cave that runs down into the bowels of the earth some 30 or 40 feet.

If we assume, then, that absolutely uniform temperature, dryness, and good food, will result in good wintering, then a deep cave under ground would be an ideal place. But only one bee-keeper in about ten thousand would be able to find such a cave on his farm or probably in his vicinity, so we should have to consider that scheme as impractical. But a deep cellar under the dwelling-house, having a packed double floor above, with a porch running around the cellar, might possibly hold a temperature of 45 degrees. See Doolittle's article in this issue.

THE COLORADO STATE BEE-KEEPERS' CONVENTION; SUPPLIES, FROM THE STAND-POINT OF WESTERN BEE-KEEPERS.

AFTER I had come to the decision that I would attend the Colorado State Bee-keepers' Convention, I wrote to Sec. Rauchfuss my intention. In acknowledgment of my letter he said he was glad to know I would be able to attend, and that he *thought* I would find this visit pleasant and profitable. What he meant by "pleasant and profitable" I did not quite understand; but from some other references in the letter I suspected that the words had a sort of sinister meaning. Well, when I arrived at the convention, and heard part of the discussions, I concluded that the members thought that this was a good time to give "Bro. Root" and other supply manufacturers a little "shaking up." I was quite prepared to take my medicine, either good or bad. With knowing winks and significant glances they first began by giving me homeopathic doses; and when they found I rather enjoyed it, and that I came there for the express purpose of assimilating, and that I would consider the giving of bad as well as good medicine as a friendly act, they gave me larger doses—more on the allopathic order. I told them to "fire away," and when they had got all through I would "have my say," providing there was any thing left of me. This invited a bombardment, to change the figure, which then commenced.

First, the brood-frames sent out by Bro. Root varied in length. Some of them liked Hoffman frames, and some didn't. Some of them were decidedly opposed to having the top-bar shortened. When I got down to the gist of the whole matter I found that it was not the frames, but the hives, that varied. The frames were of the same length, because I compared those made by us and one of our competitors. But here was the trouble: Some of their hives were longer than those made by ourselves, by $\frac{1}{4}$ inch, with the result that the brood-frames made by either of us had a fashion of dropping down in such hives, because the top-bars were hardly long enough to bite on to the rabbets. So far the Root Co. were clearly not to blame. Next they scolded about covers that were too short, and that were made by Bro. Root too. Right here I had to acknowledge the corn, for there was no loophole bigger than the eye of a needle out of which I could crawl; and I

didn't try the act, for it had transpired that one of our workmen, mistaking one of our orders, made covers $\frac{1}{8}$ inch *shorter* instead of that much *longer*; and, worse than all, nearly all of this lot, before the mistake was discovered, went to Colorado.

One good brother got up and said he could not see any sense in having no-drip cleats in shipping-cases. Another arose to his feet and said he thought this feature was the best improvement that had been made in this line for some time. Still another supposed that the cleats were to cover the edges of the sections, and he had been in the habit of putting the cleats just behind the glass in front of the perpendicular edges of the sections. This produced more or less of a laugh. On the whole, the no-drip shipping-case seemed to be able to stand on its own bottom.

Next the covers were complained of—not particularly "Bro. Root's," but those made by any supply-manufacturer. They would warp and twist all out of shape; the nails would pull out, and the board would split where the nails passed through; and it was hoped that Mr. Root would, during his short stay in Colorado, look over some apiaries, so that he might see the actual effect of a Colorado sun and climate.

By way of parenthesis, right here I will say that I did visit several apiaries. Boards would indeed, when not painted, shrink all the way from $\frac{3}{8}$ to $\frac{1}{2}$ inch to the foot; would curl and twist, and the nails that had been driven "clear home" would be sticking out of the boards anywhere from an inch to almost their entire length. Covers that had been nailed up for four or five years, and hadn't been painted, showed nails sticking up, and so loose they could be easily pulled out with the fingers. One might go around and drive them down with a hammer, but the heads would bob up just the same the following summer.

In the convention some expressed a preference for covers covered with tin; but these were objected to on the ground that the boards curled under the tin so that they would not fit down squarely on the top of the hives. Some covered the boards with canvas, and then thoroughly painted the whole with white lead. This answered very well, but was too expensive. I was requested to see what could be done in the way of procuring covers made of papier-mache, pasteboard, or some material that would stand their exacting climate. As it rains in Colorado but rarely, and as the sun, by reason of the almost cloudless sky, and an atmosphere as clear as crystal, beats down with unrelenting force, it was urged that something different be devised. A cover that answered every requirement in the East, and, in fact, in many portions of the West, where there was more or less humidity in the air, was almost totally unsuited to Colorado and other regions so dry that irrigation had to be resorted to in order to grow any crops or secure plant life of any sort.

A new strawboard works has been started near us, and we shall look into this matter very carefully.

The Coloradoans do not need a cover so

much to keep out rain as something that will hold the bees in the hive while it is being moved, and to prevent the ingress of robbers at any point except the entrance. The climate is so dry, and rain so infrequent, that I found that barns are unnecessary for the storage of hay; and, actually, edged tools, such as planes, saws, chisels, and the like, are left out on work-benches in the back yard—no need of carrying them indoors; there is scarcely ever any dew, and very seldom any rain.

FENCES AND BURR-COMBS.

Returning to the subject of supplies, at another session of the convention I was made the recipient of a little more bombardment on some of the recent changes that have been made. Some of the brethren could see no use in fences. At one time it appeared I was going to get the worst of it; but when Secretary Rauchfuss and others thought I had been hammered long enough, the tables were turned slightly in my favor. Mr. Rauchfuss reported that quite a number were very much pleased with the fences; and J. W. Harris, of Rocky Ford, Col., said that, in his vicinity, the fence was growing rapidly into favor; that the Abbey-Hardy Co. greatly preferred to buy honey in plain sections, and would take it in preference to that in the old style, any time. Some fence honey was exhibited by Mr. Herman Rauchfuss, brother of Frank, that had been attached to the fences by means of burr-combs. On removing the sections, of course the capping was torn off in little patches. This experience, so far as I know, seems to be quite unusual. Indeed, at other sessions I learned that bees in Colorado have quite a fashion, under some conditions and during some seasons, of fastening comb honey in old-style sections to wood separators; and, in fact, there had been so much trouble that one man reported he did not care to use separators at all, and argued quite in favor of no separators in comb-honey supers. But of this I shall have more to say at another time.

Referring to burr-combs being attached to fences and sections, Mr. M. A. Gill, formerly of Wisconsin, now of Boulder, Col., reported in GLEANINGS for February last, that "while casing 400 cases about equally divided between the no-beeway and the old style we did not have enough crooked or broken honey for table use for two families." Mr. Gill did not arrive at the convention until near its close, which was some time after this discussion had taken place; but mistaking him for Mr. Hill, instead of my old friend whose name began with a G, I did not talk with him on this question as I would have done had I known his identity; but learning my mistake, after arriving home I asked him if he had had any trouble with burr-combs being attached to the combs in plain sections. In reply he says:

In answer to your question as to whether I am bothered with "burr-combs" in using your fence system, I will say at first I was to some extent; but it mostly came about by having careless help in putting in starters. I found, if any thing happened to a section of comb (with that system), almost invariably one on each side was involved in the mishap.

My first year's experience with fence separators was 800 supers in three apiaries of our own (Mr. T. M. Todd, of Grand Junction, Col.); besides these I came in con-

tact with many more, as I was bee-inspector of Mesa Co. at that time, which gave me an opportunity to see the results under different conditions and management.

My conclusions were these: That there are three essentials in the use of the fence system.

1. All starters must be perfect. They should reach (practically) clear across the section, with no ragged edge at the bottom, no little bits hanging crosswise, nor corners turned out.

2. With these narrower combs it is absolutely necessary that the hives be level from side to side.

3. The manipulator must see to it that colonies never become overcrowded for room during a heavy flow or while comb-building is being actively carried on; better have a little too much room than not enough.

In my opinion, if the above conditions are carried out, there is no system for comb honey that will give so great a per cent of perfect section as the fence-separator system. M. A. GILL.

Boulder, Col., Dec. 23.

Right in this connection, before we dismiss this subject of supplies, I should like to say that we, the Root Co., and for that matter I believe *any* supply-manufacturer, are always glad to receive suggestions—yes, even criticisms. Personally I consider, as I said, all such as friendly acts, and really a proof of friendship, providing that those criticisms are offered in the spirit of friendship, and those offered at Denver were of this sort.



He that soweth to his flesh shall of the flesh reap corruption; but he that soweth to the Spirit shall of the Spirit reap life everlasting.—GAL. 6:8.

Our friends will remember my talk in our Dec. 1st issue in regard to expectorating on the streets, and in closets and other places. Well, I am happy to tell all who may be interested in the matter that that little talk of mine effectually cured the whole business on our premises; that is, there has been none of it in our closets since then. We had them scrubbed up nicely, the baseboards, blinds, and pipes neatly painted, some boxes of sawdust provided in the way of spittoons, and up to this writing I have not seen a trace of any thing filthy on the floor, and not very much of any thing in the boxes of sawdust. There has been such a complete reform that I almost felt as if I had been more severe in my talk than I needed to have been.

But even if we did win one victory, there are still other evils to fight. Several times of late I have been told that the small boys of our establishment are using tobacco to an alarming extent. When the matter was first made known to me I concluded my informant must have overstated it, because I thought I knew of so many of the boys who surely would not touch tobacco in any shape or manner. But I was reminded again of the matter, and was told that there were several under the age prescribed by the laws of our State, in regard to giving or selling the narcotic. I decided to talk to the boys one at a time whenever opportunity offered, where I could see them alone, and I did some talking. Finally,

some one who had an opportunity of knowing said he feared every boy in a certain large department was not only chewing, but the most of them were smoking also. He said they did not smoke on our premises (our insurance policies forbid it); but that if I would watch them when they went home nights I might see a great lot of boys pulling pipes out of their pockets, lighting them, and going through the town puffing away in order to *advertise* the fact, as it would seem, that The A. I. Root Co. had "let up" on its stringent rules of former years in regard to the use of tobacco. I confess I was a great deal troubled by this report, and I said, "Why, I am sure there are several boys in the room you mention who do not use tobacco in any shape or manner."

"Will you please name one such?"

I mentioned a boy of whom I felt about as sure as I would of our own boy Huber. He is just about Huber's age. To my astonishment, my informant replied:

"Mr. Root, you can not feel any more pained than I do when I tell you that this very boy," calling him by name, "has been puffing a pipe on the streets with the rest of them. My impression is that he has been 'bullied' into it. They have got a going to such an extent that, if there is one boy in their room who hangs back, they torment him until he smokes a whiff or two, so that they will let him alone. In fact, there seems to be a sort of concerted plan among the boys to make all the good boys join in, so there will be more of them to be reproved when their employers undertake to do something about it."

In order to be sure I was not mistaken I asked several of the older people in our employ (those who "love righteousness") in regard to the matter, and the report every time was that the statement made me was pretty nearly correct.

Very soon afterward I stated the matter to the younger members of our firm, remarking that something should certainly be done; and I think I suggested myself that I did not think we should be very severe on the boys if we decided not to keep any boy under age who continued to use tobacco. Well, every member of our firm indorsed what I said, and some of them did so rather emphatically. Then I made haste to say, "All right, boys; but we will not adopt any such severe measures as this before we have tried gentle means." Then Ernest immediately suggested that cast-iron rules were to be avoided in all matters of this kind unless no *other* means would accomplish the result. Then I petitioned to have the matter left in my hands. God knows it has never been in my heart to dismiss any boy, even for the use of tobacco. If, however, we have a boy in our employ who can not be dissuaded from trying to entice others, especially other boys younger than himself, into the tobacco habit, then we shall certainly have to dismiss him. At the present writing I have met and talked with a good many of the boys; and while several of them have admitted that the statement made to me was pretty nearly true, I am sure I have a good many of them

working on my side, even if they did not give me a positive promise to do so.

And, now, dear friends, while I talk through these pages to some of the boys of our establishment, who knows but this same talk may, through God's providence, strike some other boys, and set them to thinking in a healthy and reasonable way? Some of the older ones may blame me for appealing to the boys' lower feelings, instead of the higher and spiritual that are involved in this matter; but boys (and some *men*) will always listen to anything that touches the pocketbook. First, did any of you boys ever know of any one (boy or man either) who got a raise in wages *because* of the fact that he used tobacco, either chewing or smoking? Well, I have known quite a few who got *less* wages because of this habit. And then they were out of pocket too, because of the expense of such a habit. I do not mean, mind you, that their employer paid them less because he was cranky on the subject (as you may think I am); but he paid them less because they were *worth* less. Tobacco destroys the nerves; and nerves and brains are what every employer wants at the present day. Why, my young friend, you would think the proprietor of a saloon who hires a man to sell beer and tobacco (for the latter always goes with the former) would expect, of course, that his clerk would use beer and tobacco both (to be consistent), would you not? Well, just the other day I was reading an article in one of the periodicals that defends the saloon business. There are several such journals, and I read them almost every week to see what our friends on the other side of the subject have to say. Well, this journal was recommending a candidate for some public office. They said like this: "Mr. —, it is true, is the proprietor of a saloon; but we are able to tell you that he is not only a total abstainer, never drinks a drop of any thing intoxicating, but he does not even use tobacco *in any shape or manner*. He is just as clean a man as any of the temperance fanatics can bring forward." Well, boys, I thought this periodical was rather "giving themselves away," as you express it in slang phrase. They are arguing for the beer and tobacco traffic in every issue, and upholding the business by every means in their power; and yet when it comes to wanting a *good* man to fill an important office they actually *boast* because they have got one who does not himself use any of the stuff he sells to other people. Let us now go back to the pocketbook part of the business.

If you should lose the place where you now are working, and should desire to go somewhere else, you would command better wages anywhere in the world (even if you were going to clerk in a saloon), if the recommendation read something like this: "The bearer, John Smith, has no bad habits; never drinks any thing intoxicating, and does not even use tobacco in any shape or manner." The whole wide world wants clean boys, and is willing to pay for them. Now look here: I do not mean to say that every boy who does not drink, chew, or smoke, can get good wages; for I know as well as you do that there are

lots of temperate boys who are too stupid or too sleepy to be good for very much anywhere; and there are lots of keen, bright, smart boys who use tobacco. The point I make is this; Other things being equal, the clean boy gets better pay.

I have written a great many times about work and wages, and have tried to tell the boys how to get better pay. I have many times spoken of the very great importance of being loyal to one's employer; of putting yourself in harmony with his likes and dislikes; that is, of course, so far as you can honestly and consistently do so. Suppose you are working for a man who has a great fancy for dogs, while you (like myself) do not like dogs. Well, now, this dog business is a question where there are many differences of opinion. Every man has a right to keep as many dogs as he pleases, or breed high priced dogs for sale, providing, of course, his dog industry does not trespass on the rights of the public at large. Well, you are working for him, we will say, in some kind of business where you have not very much to do with the dogs. You are anxious to get a raise in wages. You want your employer to have a good opinion of you. You naturally put your best foot forward when he comes around. There is no harm in this; it is right and proper. Well, will it not be very *poor* policy for you to give way to your own notions, and to kick viciously one of his favorite dogs every time it comes near you? You might explain to him that you do not like dogs, and wanted them to keep out of your way and out of your sight. Well, even though he recognizes it is your privilege to dislike dogs, just the same as it is his privilege to like them, would you not be very foolish to gain his ill will and dislike in the way I have mentioned? Why, the whole wide world would say you were a boy of no *tact*, and that you would never get along in the world until you had learned to adjust yourself to your circumstances and conditions. Let us now make a little practical application of this:

I am sure there is not a man in my employ who does not know that I have fought the tobacco habit almost all my life; and I think these same boys know, too, that it is not a selfish motive altogether, but that I really have the best welfare and interests of the boys and girls both whom I have employed for so many years. I do not believe you will think I am boasting when I suggest to you that, during the years you have known me, I have not been doing business to make money; that is, making money has not been the first consideration. If I could make money by doing something that would injure the boys, I would not touch it under any consideration. You certainly know this; and as I believe tobacco is harmful to both body and soul, I would not have any thing to do with it, no matter how much money was offered. One of the favorite texts of my life has been, "Seek ye first the kingdom of God, and his righteousness and all these things shall be added unto you." In working for God's righteousness, the promise has been verified. You know, boys, that I have been blessed in trying to give people

work. Now, in view of this, how *could* you, while in my employ, formulate a plan, and carry it out, for getting every boy under age (and some of them under 16) either to chew or smoke, or do both? Did you not feel as though you were doing a dishonorable thing? and have you not felt ashamed of it? Of course, you kept the tobacco out of my sight whenever I came around near you. Was that a manly and honorable thing to do? I have been a boy myself, and God knows I was not *always* a manly or consistent boy. I remember what a fine thing we used to think it was to play tricks on the schoolmaster, and work against him. The cases are not exactly parallel, but I think this tobacco craze has come along something in the same line. I do not believe you really wanted to be bad and wicked, but that you did it because there was a sort of excitement about it that boys usually enjoy. They call it *fun*; but, dear boys, is it not best to have even our fun a manly and innocent fun? To be playing tricks on your employer, or working against him in an underhanded way, is a foolish sort of fun, is it not? for sooner or later you are sure to be found out; and how can you expect or ask for a raise of wages when you have been working *against* instead of *for* your employer? You may claim that you have not been working against my *business* interests. But ought not a man to have something higher in this world than even business? The most serious and the saddest part of this whole matter is urging good boys, with Christian fathers and mothers, to learn the tobacco habit. I think that most of you have read what I said about Mr. Herkner, on page 778. There are many others who can tell how tobacco has injured them, bodily and mentally, but not one will tell of its being a help—that is, a help in the end. Now, when you help to fasten such a habit on a boy in his youth, are you not getting pretty nearly in line with the class of people whom the Savior held up to view? Shall I tell you what he said about them? "Who-so shall offend one of these little ones which believe in me, it were better that a millstone were hanged about his neck, and that he were drowned in the depth of the sea." Some of the boys you have coaxed into this habit are members of the church. Their parents are Christian people. As I look into your faces, or when I meet you in the morning, and you respond to my salutation in a cheerful and manly way, I can not believe it possible that you are *enemies* of mine. You look friendly, and I believe you are at heart my friends, each and all of you. Dear boys, we do not want hard and severe rules in our establishment. Whenever we try to enforce rigid rules, almost every time they hurt some innocent party, and strike where we do not mean to strike. I never er want to say to any boy, "I will turn you off if you do not do so and so;" and it has been a long time since I did say it. When some boy commences to work for us, and pleasant relations begin to be established, when he helps me and I help him week after week and month after month, a tender relation grows up between us—at least it is so on my part. When

any boy "quits" without a word to his employer or the foreman of the room where he works, I always feel hurt. I get to asking myself the question over and over, "Have I been neglectful of this boy's interests in any way? Is it any fault of mine that he has left and gone away?" for whenever we have been obliged to dismiss any one, man or boy, I always feel bad after it. When we talk the matter over and mutually agree that one of our friends has had a better offer than we are able to make him, that is a different thing altogether. Then we can shake hands and wish each other success; and when one of our old hands comes around, years after, how pleasant it is to shake hands with him, and talk matters over! Then the beautiful text at the head of this talk, I have said scarcely a word about it so far; but if you will read it over I am sure you will see the connection. These things that gratify a bodily appetite, especially stimulants and narcotics, are things that are sown to the flesh, and there has got to be a harvest. "Whatsoever a man soweth, *that* shall he also reap." Mr. Herkner and others can tell you what the harvest is. But the boy who sows to the spirit—that is, to the spirit of righteousness and to the spirit of Christ Jesus—shall reap life everlasting. Here in this world he will be wanted, and will have friends everywhere; and he need never be afraid to look anybody in the face, nor to have people find out about his life and habits.* In talking with the boys, I met with three who work in other rooms. These three have lately united with one of our Medina churches, and have started out as young Christians. Do you think they use tobacco? Of course not. There may be *old* Christians who use tobacco, but I do not believe there are very many young ones. I said to one of them, "John, do you use tobacco in any shape or form?"

"No, sir. I never had a bit of it in my mouth in my life; and, what is more, I never expect to as long as I live."

Why, the thrill that it gave me when I took him by the hand and congratulated him lasted me all day. Several times I asked myself,

*One man said to me (and he is a Christian man, and a good friend of the boys too, I am sure), "Mr. Root, if your boys would show you what they have in their pockets, I think you would find a dirty pipe and a lot of tobacco—perhaps both chewing and smoking tobacco also—with almost every one of them; and I should not be surprised if *some* of the outfits would include also a pack of cards. Now, I do not know what you think about it; but as for myself, when a boy stuffs his pockets with such things I shouldn't want him around at *any* price or under any circumstances."

The above may be a little severe. But suppose, boys, I should pleasantly ask you, next time I see you alone, if you have any objection to letting me see what your pockets contain. I said this to one boy, and he admitted he was one of the tobacco-users also, or had been; but he looked up good-naturedly and said, "Mr. Root, I am perfectly willing to show you every thing there is in my pockets right now, if you care to look at them." Oh how glad I was to hear the boy say this! It was an admission that he was not using tobacco then. And now how is it with the rest of you? If I were to ask you the question as I did this one, are you perfectly willing I should see every thing you carry around daily in your pockets? Of course, I could not tell what you have unless you see fit to show me; but, dear friends, are you forgetting there is a great God above whose all-seeing eye not only takes notice of the contents of the boys' pocket, but reads the very thoughts that are in every boy's heart?

"What is it that I was feeling so bright and happy about?" And then I would remember. Now, boys, unless you have a pretty good opinion of me you may think that my next statement is a little stretch of the truth; but I assure you it is not. After I had shaken hands with John, and he had started to go away, I remembered something. I said, "Look here, John. I have some pleasant news for you that I almost forgot when I was shaking hands. The foreman of your room says you are worth more money than you have been getting." Now, I rather think *he* had something to think about that made him feel happy all day. Now, mind you, boys, I did not raise his wages *because* he had never used tobacco. That is not the way we do business. We try to pay each boy and man what he is actually worth, without respect to his notions and likes or dislikes. If he is loyal and true to the interests of our company, that adds to his value. It can not *help* adding to it. But whenever I have tried the experiment of paying somebody for "being good" it has always been a flat failure. I am entirely disgusted with the whole business from beginning to end, of *hiring* people to do right. After they have done right of their own accord, and have built up a reputation and character, then it is right and proper to pay them their money value. So please remember we are not going to *hire* any of you to give up tobacco. You must do as you see fit and take the consequences, as in the language of our text. May God help you to do right in his sight—not because there is more *money* in it, but because it is right and manly to be *pure in heart*, and clean and upright in conduct.

Humbugs and Swindles.

SELLING RECIPES, ETC.

In a recent number of one of our agricultural papers we find the following:

CIDER WITHOUT APPLES. A GOOD DRINK.
Send 25 cents for recipe. This is a money-maker.
THOMAS & CO., Box 406, New Brighton, Pa.

I would suggest, when somebody wants to advertise a recipe like this, letting the *editor* pay the 25 cents, and then print the valuable information (?) free for the whole of his subscribers. The recipe for making cider without apples does not occupy any more space than the advertisement. Here it is:

To cold water, one gallon, put dark-brown sugar 1 lb.; tartaric acid, $\frac{1}{2}$ ounce; yeast, three tablespoons. Shake well together. If made in the evening it will be ready for use the next day. THOMAS & CO.

It was not printed; and, for that matter, it was not very well written either. A quarter should pay for a nice little *book* on making cider from apples, including all substitutes; and, *finally*, there is not any thing new or novel about the recipe. You will find it in almost any recipe-book, and no doubt Thomas & Co. copied it. May be the above concoction will "set well" with *your* digestion, but it certainly does not with mine, for I have tried it.



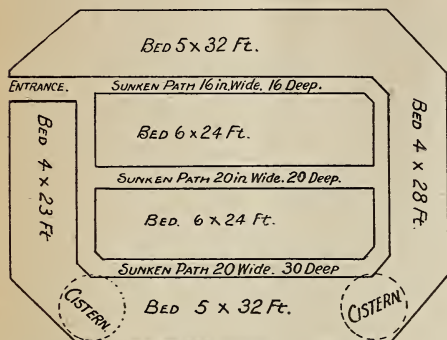
In our last I said the greenhouse I was talking about should be placed on a piece of ground sloping gently to the south. Then we should have something very much like the large picture we give on p. 38. In fact, a plan of this same building was submitted to the readers of GLEANINGS in 1893, p. 27; and it is working so well, and so very little change has been made in its construction, that I have thought it worth while to reproduce it. This house was originally all made of loose sashes; and, in fact, the sashes on both the east and west ends are movable now, and we lay them off along in March and April when it gets to be pretty warm inside. The whole south front is also raised and lowered by machinery, the sash being hinged at the eaves—see smaller cut in the upper right-hand corner. Now, this way of placing the glass, you see, covers more ground than any other method of making a greenhouse. It also has the advantage of letting the morning and evening sun go straight through the ends, as I have explained, and in the middle of the day the winter sun goes directly through at right angles to the glass in the movable sash right along the south side.

Perhaps you have already wondered how the proprietor was going to get around inside when the whole structure is not anywhere more than four or five feet above the level of the ground. Well, this is another of the advantages of the arrangement. The walks are made by cutting down below the natural surface of the ground. The sides of the beds are held up by boards nailed to stout oak stakes; and in order to economize room the paths are only 16 to 20 in. wide. On the south side of the house we have, of course, to dig deeper than on the north side; and we go only deep enough anywhere to let the head of the workman clear the glass and hot-water pipes overhead. The sash-bars are supported by strips of timber 2x6. These joists rest on one-inch gas-pipe driven into the ground sufficiently so that the weight of a heavy fall of snow on the roof will never sink them in any further.

In order to secure perfect drainage at all times it may be well to have a terrace as shown in the cut, or something equivalent, to make the water run away from the greenhouse on every side, instead of soaking down around the walls, to their detriment. First, we have not, as yet, ours arranged—that is, so far as surroundings are concerned—just like the large picture; but as we are planning something of the kind, I told the artist to make an ideal picture rather than one showing things as they really are. We have once or twice been bothered by water getting into the paths, and at one time the drain tiles got stopped up, so we had a muddy mess of it. Since we have made deep ditches all around the house we have had no trouble of this kind. The north side and both ends are banked up with coarse stable manure, clear up to the glass in winter

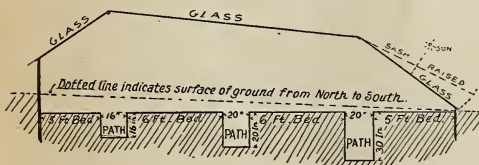
time. This makes it very warm, for the only place the frost can get in is through the glass overhead.

Below I submit two diagrams—one a bird's-eye view, and the other a cross-section from north to south. After what I have said I



BIRD'S EYE VIEW SHOWING THE BEDS, ETC.

think you will understand the whole arrangement, without any further instruction. The bed on the north side, as you will notice, is *below* the level of the ground. This makes it safe from frost. We have, until lately, drawn water for watering the plants from the hot-



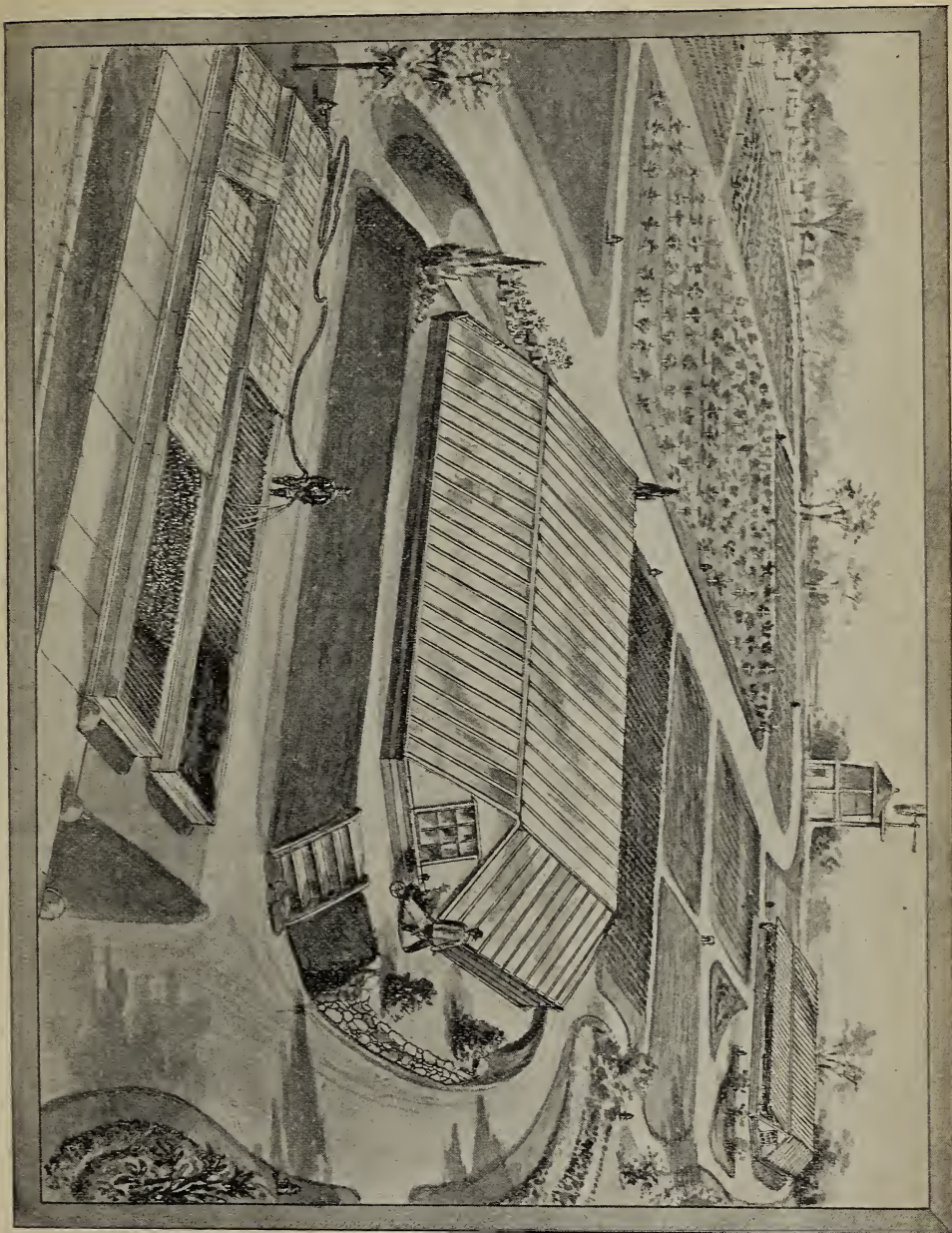
CROSS-SECTION OF THE GREENHOUSE FROM NORTH TO SOUTH.

water pipes overhead; but for several reasons I dislike hard water, or even water that contains much mineral of any kind; therefore we have put in cisterns made of a length of large-sized sewer-pipe, so that one edge of it runs under the south path. By raising a cover we can dip rain water out of either of these cisterns when we do not wish to use the well water from overhead. For showering the foliage I very much prefer soft rain water. The middle bed furthest north, 6 x 24 feet, now contains 2500 Grand Rapids lettuce-plants. They are about 3 inches apart at the first transplanting. At 40 cents per 100 these transplanted lettuce-plants will bring an even \$10; and we frequently get from \$5 to \$10 for the crop on one of these beds in 30 days. The secret of making a greenhouse pay is to have every inch of space fully occupied, and have every thing work under "high-pressure gardening." The house was intended for hardy plants only; but this year, as I have told you elsewhere, we are growing some tender hot-house stuff. I have also told you that our house is warmed entirely by exhaust steam from our factory. Well, the day before Christmas the factory was not running because it was Sunday; and of course we did not run on Christmas, so there were *two* days without any heat; and before we started

up Tuesday morning the thermometer was only 10° above zero; and to save my tender plants I set them down in the deep path on the south side, and then covered the path with newspapers. Not a plant was injured. The lettuce-plants up in the beds showed some frost, but not enough to do them any harm. If you put your tender plants in pots, so they can be set down in the paths during severe nights, you can manage without being obliged to keep up a fire all night.

The house is warmed by exhaust steam running through stone sewer-pipe under the beds, and by hot-water pipes overhead just under the glass. But such a structure would grow a great variety of hardy stuff without any heat at all except that from the sun; and further south they could be used for wintering over even tender plants, or any thing that is likely to be injured by frost during extremes of weather. Of course, the structure could be warmed by a flue, hot manure, or any of the methods usually employed to warm frames or green-houses. In our case the exhaust steam runs from east to west through the south bed; then it turns and goes back from west to east under the next bed, and so on, in a zigzag way, from one end of the house to the other, until it comes out in the open air at the northeast corner. Plants that need a good deal of heat go directly over the underground sewer-pipes, while very hardy stuff does nicely around next to the outside walls.

Perhaps you may care to know what I am doing with that pretty little greenhouse just now. I will tell you. In visiting the various parks I have often commented on the ornamental foliage-beds. Perhaps the finest show of plants and flowers I ever saw anywhere in the whole wide world was at Lincoln Park, Chicago. I have seen more expensive places, and many beautiful residences in Bermuda, as well as the millionaires' gardens in California and Florida. But money does not always purchase things I enjoy most. Near Burpee's place, at a little station in one of the suburbs of Philadelphia, I saw a bed made of coleï, geraniums, and dusty miller—at least that is what I call the latter—that filled my soul with delight. I looked on it again and again, and drank in inspiration and joy from just that little bed of plants perhaps not more than two or three rods square. Well, I am planning to have something of the sort near the Home of the Honey-bees. Of course, I am going to have all of the honey-plants in handsome shape, and then I am going to have a "posy-garden" of my own. I have lately been taking down my books on flowers, and have read with great delight Peter Henderson and Prof. Bailey, as well as the books and catalogs of our great florists. In potting strawberry plants in jadoo fiber, as we have been doing for two or three years past, I have begun to think there are some special features about the little cheap earthen pots that *make* things grow; but it was not until I was almost or quite 60 years old that I paid enough attention to books on flowers to get hold of the idea that many if not all plants could be made to make astonishing progress by starting them



in very small pots, and shifting them very gradually to the next size larger, and so on.

Plants need air as well as water and fertile soil. I have just got on to the fact that the roots need air, and must have it. Too much air dries them up, and kills them very quickly; but just enough, with just enough moisture, does wonderful things. In taking the strawberry-plants out of the pots to ship them by mail in jadoo fiber, I have often noticed with wonder the little white roots covered with mi-

croscopic hairs. Well, these rootlets are the chaps that want air; and in pursuit of air they push out very speedily until they touch the outside of the little pot; and then they really seem to love to crawl around with great speed between the pot and the soil. I have sometimes been surprised to see how quickly the roots of a strawberry-plant would make a perfect network all around against the sides of the pot; and if we do not watch them they will actually go around the pot not only once

but twice, and may be more, and finally get "pot-bound" and stop growing if the gardener does not see to it and shift them to a pot one size larger. Now, putting them into a great big pot, so you will not have to make changes so often, does not answer; that is, it does not give any such results as frequent shifting. I have tried a great many times in my life to grow flowers, but did not succeed very well. Some of my feminine friends have a knack of making every thing grow they get hold of. They will bring a dead plant to life. But my luck has always been to reverse things, and make a beautiful *live* plant "go dead." I suspected all along it was because I did not get in touch with the wants and needs of the little beauties. When I say "little beauties" I mean plants that are growing and blossoming in little bits of pots, say those with a top not larger than a silver dollar. Well, I am just learning how, and I feel almost ashamed of myself to think I found so much joy and happiness in making plants grow. When somebody hunts all around for me, and finally finds me in the greenhouse, where I have forgotten every one and every thing, I sometimes hang my head as if I were guilty, and I confess I have been a little surprised to see that Mrs. Root and the children do not scold a bit, but laugh at my devotion to my new hobby.

I have invested a little money in plants—not very much, because I was satisfied in the outset that I should find more pleasure in growing the stuff myself that I wanted, than in buying of florists "ready made." So I bought some \$5.00 worth of plants to start with. For a good while something would happen to most of them, and I killed so many learning how, that I almost began to think some evil genius had a spite against me in the line of plant-growing; but when I studied out the trouble, and began to get acquainted with the things, oh how I have enjoyed it!

A few days ago John Lewis Childs sent me two golden-leaved salvias. The two cost 20 cents. I always did love bright foliage; and when I took the little "darlings" (I can not think of any other word that expresses my feelings toward them) out of the box in which they were carefully wrapped in moss, I uttered an exclamation of surprise and pleasure. The leaves were golden without a question; and they were so pure and delicate too! and then, to cap all, each plant had a little bunch of scarlet blossoms that made a beautiful contrast with the golden leaves. At first it seemed to me as if it would be impossible to keep so much foliage on a newly transplanted plant; but I had just fixed one warm bed in the greenhouse, with a hinged sash over the top so I could confine the air and keep it constantly moist.* I put the plants in small pots, almost

cramping the roots. I then placed them in this cutting-bed, as I call it. They stayed there in a very moist warm atmosphere for about four days. Not a leaf wilted. Then I put them outside in the greenhouse. They held up just as well except when the sun shone rather brightly about noon; then they began to wilt; but by putting a newspaper over them, so as to cut off the direct rays, they held up bravely, and next morning were as bright as if they had always grown in their new location. Well, just before dictating this talk I discovered one of them had sent out quite a number of little white roots against the side of the pot, that were crawling and feeling about for air and moisture between the jadoo and the sides of the pot.

Now, this is a small thing to feel happy about; but I have got in touch with the salvias so I have started them growing without losing a leaf and without a leaf shriveling; and what I can do with salvias I can do with other things. Just a little *after* the plant puts out these new white roots, along the side of the pot, it will begin to show shoots pushing out above ground. For instance, I thought my umbrella-plant was going to die; but when I turned it out of the pot and saw a great lot of these roots, my foreboding turned to joy; and the next day, sure enough, a strong thrifty shoot came up out of the ground, which will be a "new umbrella" in a few days at the rate it is growing. And then I have got some geranium-blossoms that seem to be a little more brilliant, a little richer, and more velvety, than any flower I ever saw before; and my primroses are opening up new flowers almost every day; and my coleus-plants that got sick, and drooped their leaves, are not only putting out new roots, but they are giving me glimpses of gorgeous coloring that make me think and feel that "a thing of beauty is a joy for ever," especially when it is a plant that you have grown from the seed, or rescued when you thought it was going to die. Peter Henderson says the quickest way in the world to make a "sick plant well" is to put it in a very small pot, and in that some rich soil, giving it one good watering, and then let it alone until it gets quite dry. When it gets dry enough, if it is not too far gone it will send out some new roots toward the sides of the pot; and when the tiniest new root starts, then you may know you have gained the victory.

I forgot to say in the proper place that a new root or a new leaf or a new flower interests me *almost* as much as the new baby that I have told you something about. He is just beginning to make visits over to his grandpa's, and occasionally he treats us to one of his bewitching smiles. I suppose his happy mother watches each development of intelligence very much as I watch and study the habits of my "little posies."

out roots and makes a plant! In watching this wonderful process it made me feel as if I was getting in touch with, or delving into the secrets, as it were, of the great Father above; and this astonishing thing we call "life" is not only held wrapped up in the tiny seed, but in every twig, and even each individual leaf, of every growing plant. "How wonderful are thy works, O Lord!"

* Since the above was in type I have succeeded in taking a slip from one of those salvias, and getting it to take root in my forcing-bed, and now it is in the little pot with jadoo fiber, sending out roots of its own, circling around the sides of the pot for air and moisture. It was done so quickly and so easily I am sure I can make a hundred more just like it, with scarcely a failure. Of course, this was done in the forcing-bed I have described. Just think of taking a little twig from a growing plant, or even a single leaf, for that matter, and giving it so much "encouragement" that it sends